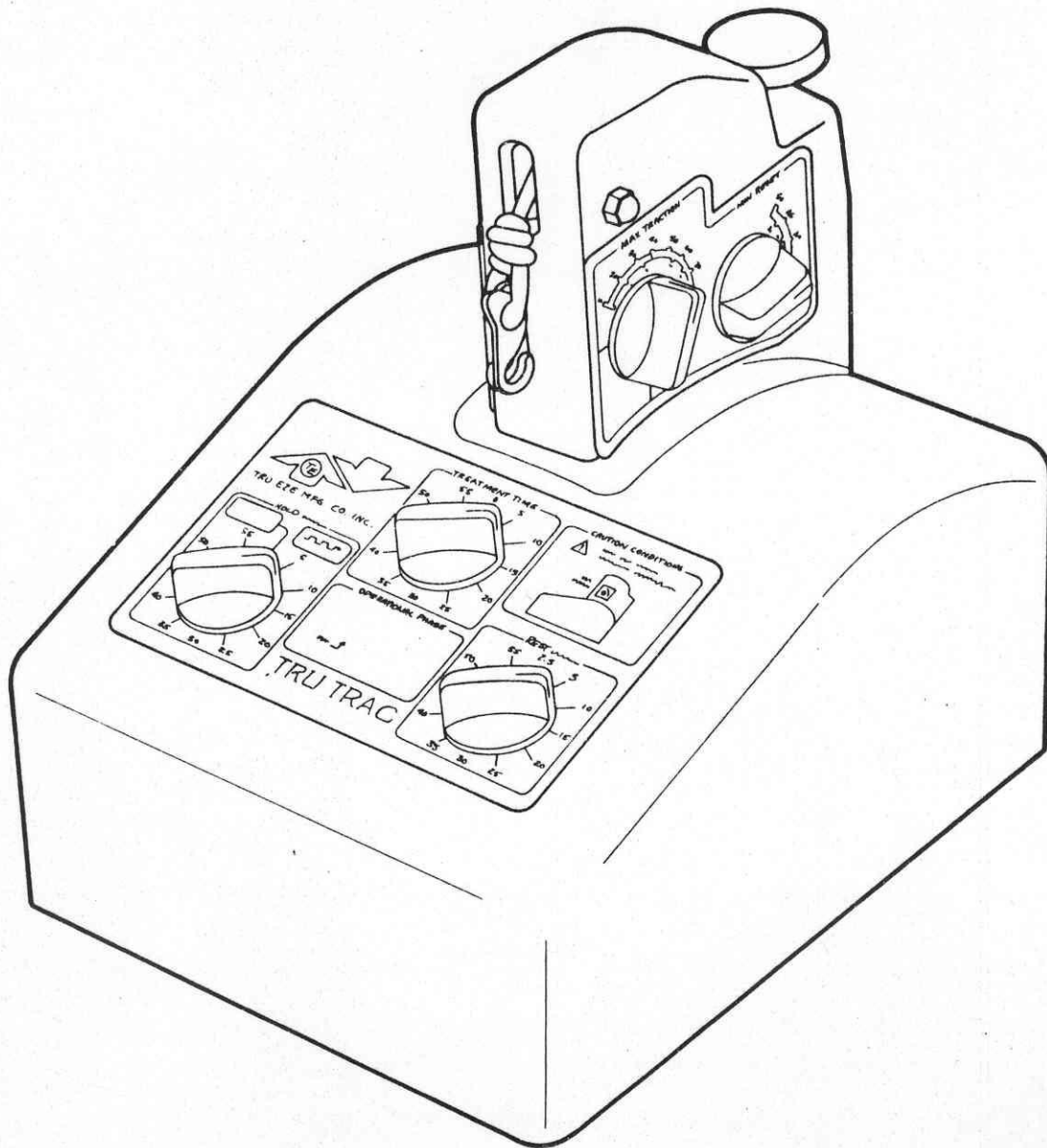


TRU-TRACTM TT-92B SERIES

PORTABLE
INTERMITTENT
TRACTION MACHINE



SERVICE MANUAL

PREFACE

THIS SERVICE MANUAL IS A GUIDE TO THE MAINTENANCE AND SERVICE PROCEDURES OF THE TT-92B SERIES TRACTION MACHINE. REFER TO THE OPERATION INSTRUCTIONS (DOCUMENT NO. 990002) FOR SAFE AND PROPER USE.

IF YOU DO NOT HAVE A COPY OF THE OPERATING INSTRUCTIONS PLEASE WRITE, FOR A FREE COPY.

**TRU-TRAC THERAPY PRODUCTS INC.
P. O. BOX 880
TEMECULA, CA 92390**

WARNING

IF YOU ARE NOT A QUALIFIED BIOMEDICAL OR CLINICAL ENGINEER, DO NOT ATTEMPT TO REPAIR A TRU-TRAC™. Repairs by unqualified personnel or the use of replacement parts not supplied by TRU-TRAC THERAPY PRODUCTS INC. is DANGEROUS and may cause machine damage, malfunction, electrical shock, fire, or personal injury.

READ THIS SERVICE MANUAL CAREFULLY AND
COMPLETELY BEFORE ATTEMPTING REPAIRS.

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INTRODUCTION

This Service Manual is designed to aid qualified personnel in the repair, maintenance and calibration of the TT-92B. Identification of parts is simplified by the inclusion of itemized parts lists in each assembly section. When ordering spare parts from the factory, it is necessary to specify the model number (eg. TT-92B), the serial number, the part number, and the description of the part.

When it becomes necessary to remove a part or parts, follow the disassembly sequence at the beginning of Section I. Proceed until the part or parts become accessible.

Re-assembly

Start with the last disassembly sequence used and work in the reverse order for re-assembly. Watch for "NOTES" in each section that will help you with a particular re-assembly technique.

WARNING!

DO NOT CONNECT THE MACHINE TO THE ELECTRICAL SUPPLY WITHOUT FIRST VERIFYING THAT IT IS THE CORRECT VOLTAGE. Incorrect voltage may cause machine damage, malfunction, electrical shock, fire or personal injury. Your TT-92B series TRU-TRAC™ was constructed to operate only on the electrical voltage specified on the voltage rating and serial number plate. Please contact your supplier if the machine is not properly rated.

DO NOT USE A DAMAGED POWER SUPPLY CORD. Using a damaged power supply cord may cause machine damage, malfunction, electrical shock, fire or personal injury. If the power supply cord becomes damaged, immediately discontinue using the machine and contact the factory for replacement of the power supply cord.

DO NOT USE A WORN BRAIDED TRACTION CORD. Using a worn braided traction cord may cause machine damage, malfunction, or personal injury. If signs of wear are observed on the braided traction cord, immediately discontinue using the traction machine and consult the factory for replacement of the braided traction cord.

DO NOT PERMIT ANY FOREIGN MATERIALS OR LIQUIDS TO ENTER THE MACHINE. Care should be taken to prevent any foreign materials, including but not limited to inflammables, water and metallic objects, from entering the machine. Foreign materials such as inflammables, water or metallic objects may cause machine damage, malfunction, electrical shock, fire or personal injury.

DO NOT MODIFY OR REMODEL THE MACHINE OR ACCESSORIES. Modification or remodeling of the machine or accessories may cause machine damage, malfunction, electrical shock, fire or personal injury.

USE THIS MACHINE ONLY WITH TABLES, STANDS AND ACCESSORIES SPECIFICALLY DESIGNED AND MANUFACTURED BY TRU-TRAC THERAPY PRODUCTS INC. FOR USE WITH A TRU-TRAC™. Using this machine with tables, stands or accessories not specifically designed and manufactured by TRU-TRAC THERAPY PRODUCTS INC. for use with a TRU-TRAC™ may cause machine damage, malfunction, electrical shock, fire or personal injury.

PLEASE READ WALL MOUNTING INSTRUCTION IN THE INSTRUCTION MANUAL BEFORE ATTEMPTING TO MOUNT THIS UNIT ON THE WALL.

GENERAL DESCRIPTION AND PURPOSE

The TT-92B Portable Intermittent Traction Machine is designed to apply both cervical and lumbar traction with maximum traction capacity from 10 to 100 lbs. (4.5 to 45 kgs.).

Up to 200 lbs. (90 kgs.) with Catalog No. PT-113 Poundage Doubler Accessory.

The minimum traction function will control the release phase of traction from 5 to 50 lbs. (2.3 to 22.5 kgs.).

This traction machine provides up to one hour of static or intermittent traction treatment. Accurate quartz locked variable "hold" and "rest" timers in 2.5 second increments adjust the intermittent pauses up to 57.5 seconds.

EQUIPMENT SUPPLIED WITH TT-92B

The accessories with the TT-92B Traction Machine include the following:

- 1) HH-57 - Head Halter
- 2) 868340 - Power Cord
- 3) PT-110 - Line-tite clamp with extension cord.
- 4) SC-31S - Spreader Bar with Strut
- 5) 996002C - Operating Instructions
- 6) 997200B - Warranty Registration Card

EQUIPMENT REQUIRED (NOT SUPPLIED)

The only equipment required is a securing mechanism for stabilizing the traction machine; i.e., a wall mount, a traction mounting stand, or a traction table with traction mounting arm.

EQUIPMENT SPECIFICATIONS, POWER REQUIREMENTS, TECHNICAL CHARACTERISTICS AND COMMON CIRCUIT DESCRIPTION

The TT-92B is designed to operate from a supply voltage of 100, 120, 220, or 240 volts ($\pm 10\%$) at either 50 or 60 hertz. These voltages may vary $\pm 10\%$ without detrimental effects on system operation.

A built-in power supply reduces the line voltage to the appropriate low level DC voltages for the equipment. All internal functions are performed by 24 volts or 12 volts DC.

A printed circuit board mounted directly behind the instrument panel contains all components required for the control circuits of this device. See page 38 for complete circuit diagram and page 38 for PC Board component layout.

The traction mechanisms are mounted in the main casting assembly and consist of the drive motor, the switcharm assembly and the traction cams. A group of snap-action switches mounted to the switcharm determines the traction limits of the TT-92B. These switches are activated by cams mounted coaxially to the maximum and minimum traction dials. The unit is provided with a number of safety features designed to prevent excessive traction in case of circuit malfunction or misadjustment. A safety switch, mounted on the switcharm assembly, will disable the unit in case the pre-set maximum traction force is exceeded by more than approximately 10 pounds (4.5 kilograms). Activation of this switch will disconnect the logic circuit, stop the machine and gradually release all traction. The TT-92B can also be disabled by activating the Patient Interrupt Switch.

PERIODIC PREVENTIVE MAINTENANCE

A preventive maintenance inspection and calibration check is recommended every six months. Arrange with your dealer or other local qualified service personnel for this servicing. In the interest of safety, do not attempt to perform this maintenance yourself. (See page 40, 41 for calibration procedures).

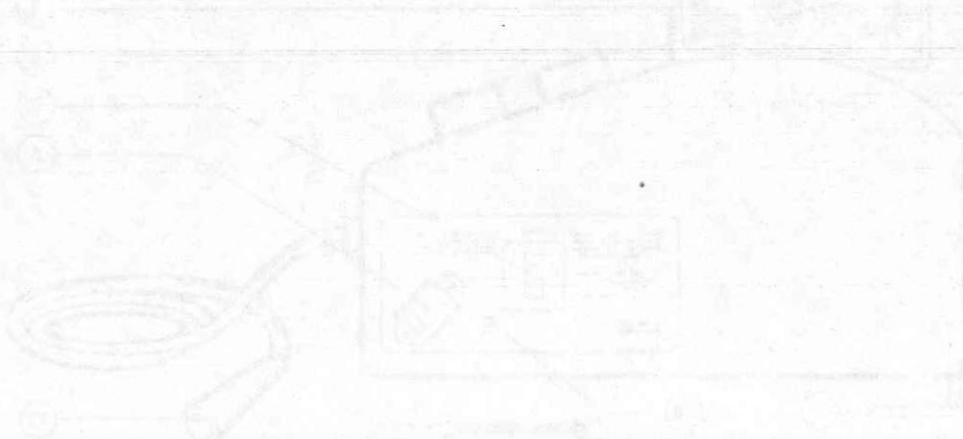
To clean the machine, wipe it with a cloth. Do not use thinners or solvents as these may damage the surface or blur the instrument panels and dials. For more thorough cleaning, wipe with a cloth dampened (not dripping wet) with a diluted neutral non-abrasive cleaning agent (i.e., "409" or "Fantastic" brands). PREVENT LIQUID AND FOREIGN MATERIALS FROM ENTERING YOUR TRU-TRAC.

STORAGE INFORMATION

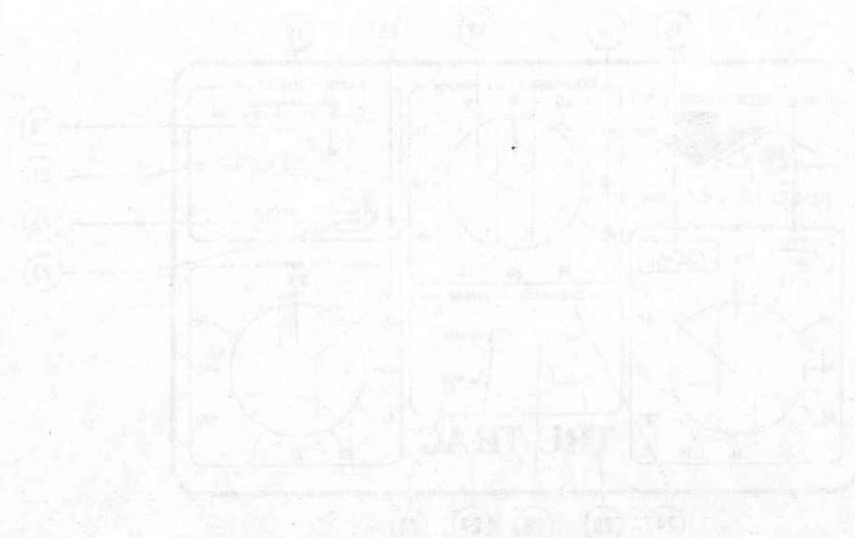
Cover traction machine when not in use. When storing traction machine for an extended period of time, store in original carton. Unlimited shelf life stored in original packaging. Do not store in direct sunlight. Do not expose to extreme temperatures or to moisture. Not intended for outdoor storage.

For long term storage, store unit in a sealed plastic bag within the original packaging.

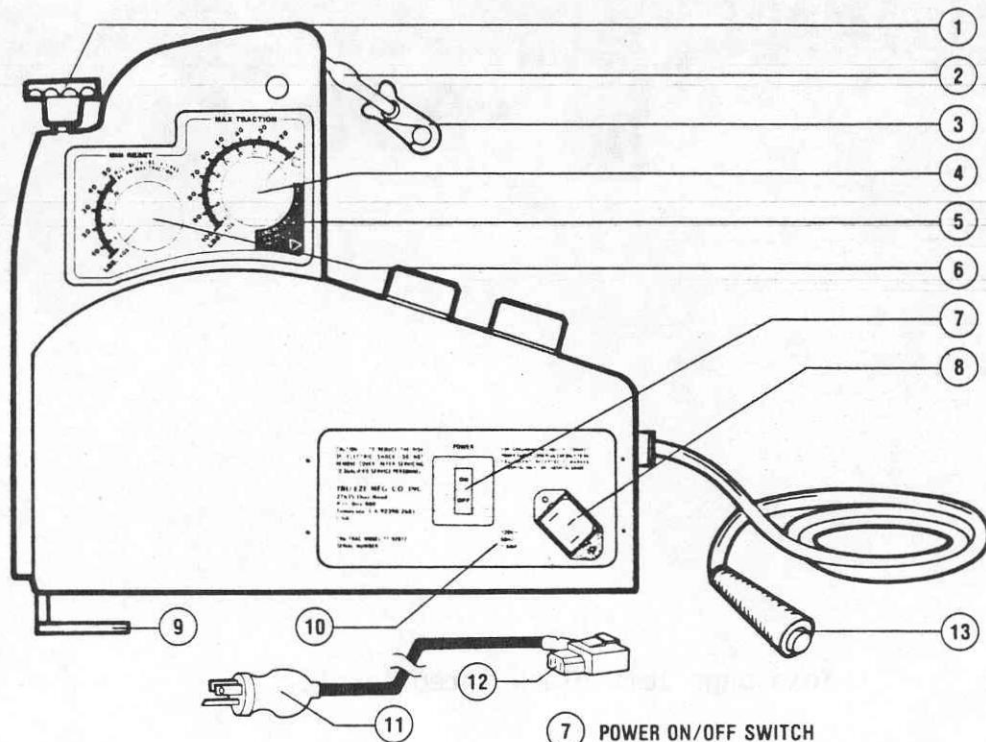
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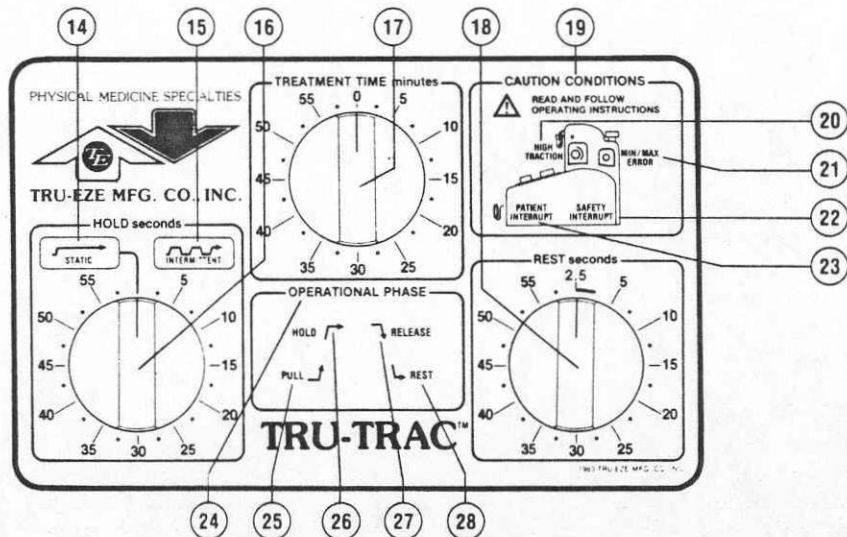
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CONTROL REFERENCE GUIDE

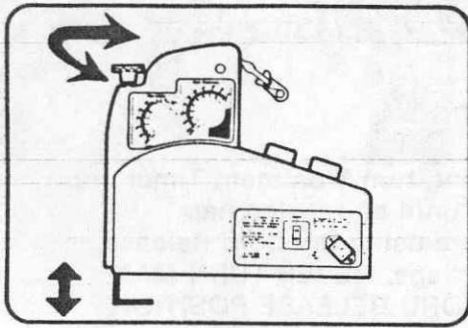


- | | |
|-------------------------|---|
| 1 CLAMPING KNOB | 7 POWER ON/OFF SWITCH |
| 2 BRAIDED TRACTION CORD | 8 POWER SUPPLY RECEPTACLE |
| 3 ACCESSORY CONNECTOR | 9 CLAMPING BRACKET |
| 4 MAX TRACTION KNOB | 10 VOLTAGE RATING & SERIAL NUMBER PLATE |
| 5 CORD RELEASE POSITION | 11 POWER SUPPLY CORD (MALE END) |
| 6 MIN RESET KNOB | 12 POWER SUPPLY CORD (FEMALE END) |
| | 13 PATIENT INTERRUPT SWITCH |

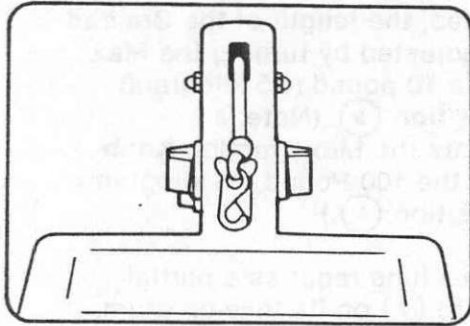


- | | |
|---|------------------------------|
| 14 STATIC TRACTION MODE INDICATOR | 21 MIN/MAX ERROR DISPLAY |
| 15 INTERMITTENT TRACTION MODE INDICATOR | 22 SAFETY INTERRUPT DISPLAY |
| 16 HOLD TIMER KNOB | 23 PATIENT INTERRUPT DISPLAY |
| 17 TREATMENT TIMER KNOB | 24 OPERATIONAL PHASE SECTION |
| 18 REST TIMER KNOB | 25 PULL PHASE DISPLAY |
| 19 CAUTION CONDITIONS SECTION | 26 HOLD PHASE DISPLAY |
| 20 HIGH TRACTION DISPLAY | 27 RELEASE PHASE DISPLAY |
| | 28 REST PHASE DISPLAY |

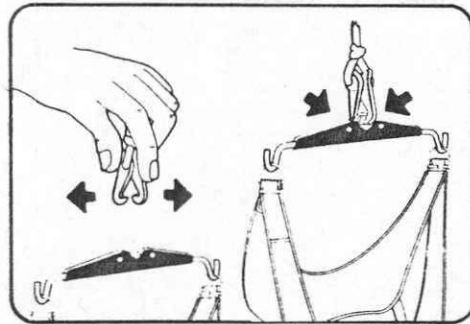
OPERATING CONTROLS AND FEATURES



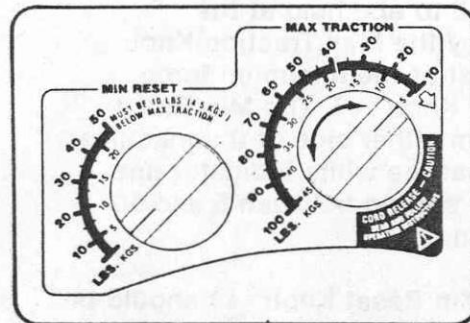
1. The Clamping Knob (1) is used to extend or retract Clamping Bracket (9) when installing or removing the machine. See "Installation" instructions for details.



2. The Braided Traction Cord (2) is securely attached to the Accessory Connector (3) with a special "bowline" knot. This knot should never be untied or cut off. To prevent wear and fraying, the machine should be mounted facing toward the desired direction of pull so that the Braided Traction Cord (2) does not contact the side of the slot from which it extends. Do not use the machine if signs of wear or fraying are observed on the Braided Traction Cord (2) — consult the factory for replacement. Read and follow warning on page 1.

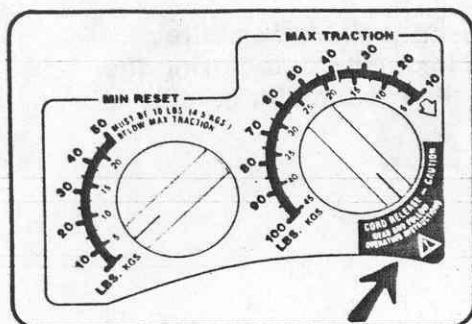


3. The Accessory Connector (3) is opened by using the thumb and index finger to "pinch" the two "tabs" towards each other inside the loop at the end of the knot. This action opens the Accessory Connector (3) to accept the metal bar or metal ring of the desired accessory such as Catalog Number SC-31S Spreader Bar or Catalog Number PT-110 Line-Tite Clamp with traction cord extension. Close the Accessory Connector (3) so that both halves engage the desired accessory.



4. The Max Traction Knob (4) is conveniently accessible from either side of the machine. The knob is used to determine the maximum traction force to be applied during the Hold phase and should be turned so that the white indicator line corresponds to the prescribed traction force between 10 and 100 pounds (4.5 and 45 kilograms) on the Max Traction dial.

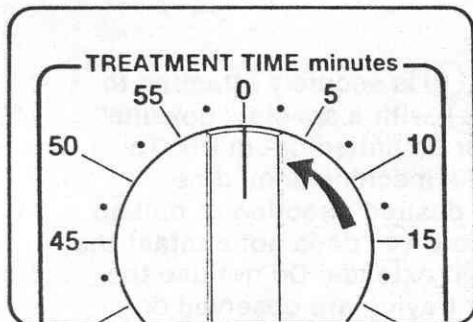
The Max Traction dial settings in pounds are marked in cream colored numerals next to the graduations on the outside edge of the curved scale. Settings in kilograms are marked in orange colored numerals next to the graduations on the inside edge of the curved scale. The high traction range above 40 pounds (18 kilograms) on the curved scale is colored yellow as a caution reminder to the operator — see the description of High Traction Display (20) for details.



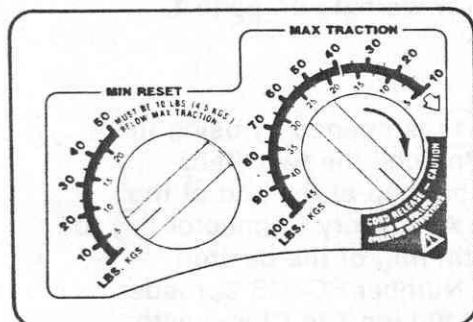
5. The  symbol on the Cord Release Position (5) of the max traction dial is intended to alert the user to the following:

CAUTION!

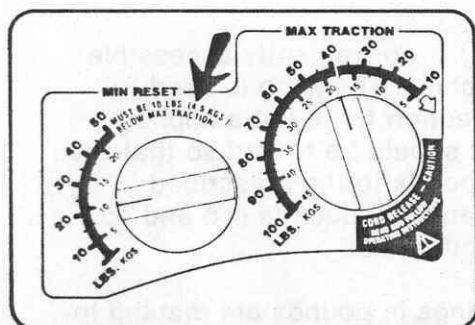
To interrupt or stop treatment, turn Treatment Timer Knob (17) to zero and wait until all tension has released automatically before using the Cord Release Position (5). To prevent damage, NEVER TURN MAX TRACTION KNOB (4) TO CORD RELEASE POSITION (5) WHILE TRACTION FORCE IS APPLIED TO BRAIDED TRACTION CORD (2).



With no traction force applied, the length of the Braided Traction Cord (2) may be adjusted by turning the Max Traction Knob (4) past the 10 pound (4.5 kilogram) setting to Cord Release Position (5). (Note: a mechanical interlock prevents the Max Traction Knob (4) from being turned past the 100 Pound (45 kilogram) setting to Cord Release Position (5).)

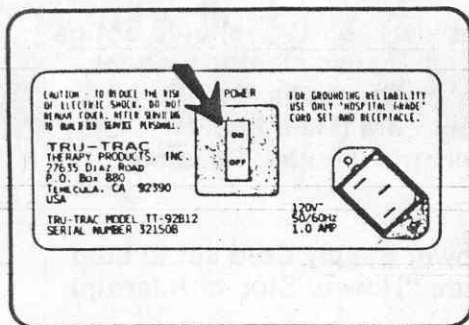


For proper operation, the machine requires a partial turn of Braided Traction Cord (2) on its take-up drum. Therefore, if a longer cord is desired (such as for lumbar traction), we recommend the use of Catalog Number PT-110 Line-Tite Clamp with traction cord extension.

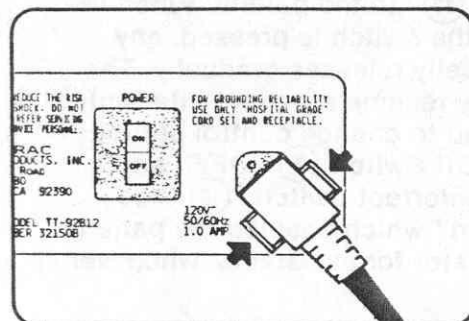


6. In intermittent (rhythmic) traction treatments, the machine will repeatedly pull to and hold at the maximum force indicated by the Max Traction Knob (4), then release to and rest at the minimum force indicated by the Min Reset Knob (6). The Min Reset Knob (6) is accessible from either side of the machine and should be turned so that the white indicator line corresponds to the desired setting between 5 and 50 pounds (2.3 and 23 kilograms).

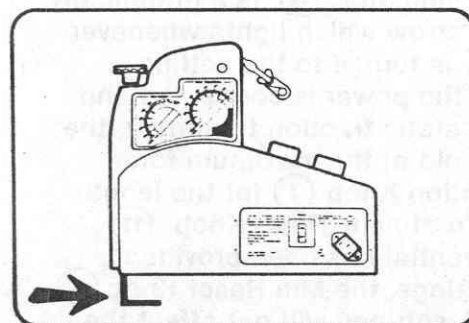
For proper operation, the Min Reset Knob (6) should be set *approximately* 10 pounds (4.5 kilograms) below the Max Traction Knob (4) settings. See the description of Min/Max Error Display (21) for details on Insufficient differential between Min and Max settings.



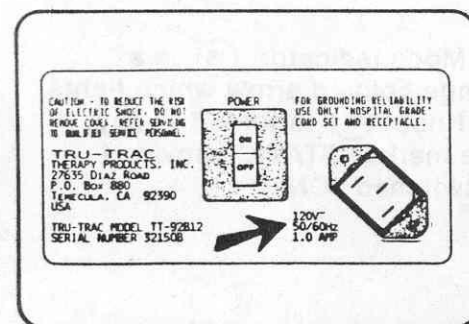
7. The Power On/Off Switch (7) is also a circuit breaker which takes the place of a conventional fuse in providing electrical current overload protection. To resume use after the circuit breaker automatically turns the Power On/Off Switch (7) to the "OFF" position, simply move the switch back to the "ON" position. Failure to stay in the "ON" position indicates a condition requiring repair; immediately disconnect the Power Supply Cord (Male End) (11) from the electrical outlet and consult the factory for repair service. Do NOT use the Power On/Off Switch (7) to stop or interrupt treatment — see "How to Stop or Interrupt Treatment" instructions.



8. The Power Supply Receptacle (8) accepts the Power Supply Cord (Female End) (12) and provides locking tabs which must be fully engaged to ensure proper connection — see "Before Installation" instructions.



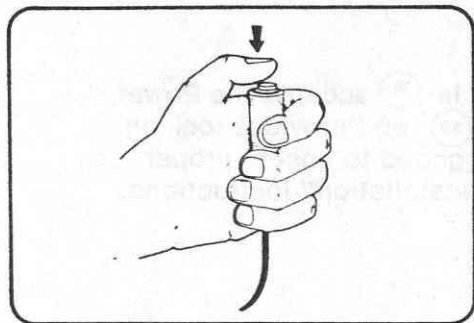
9. The Clamping Bracket (9) secures the machine to its receiving mount — see "Installation" instructions.



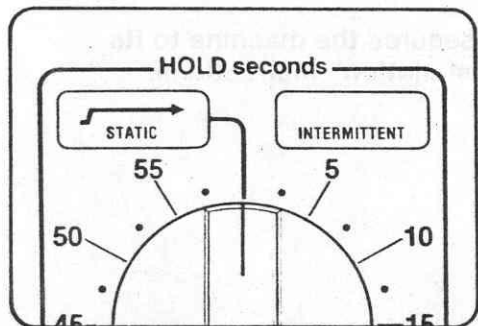
10. The Voltage Rating & Serial Number Plate (10) specifies the only electrical voltage on which the machine was constructed to operate. Do not connect the machine to the electrical supply without first verifying that it is the correct voltage. Contact your supplier if the machine is not properly rated — see "Before Installation" instructions.

11. & 12. The Power Supply Cord set (11) & (12) should not be used if damaged as this could cause electrical shock — see "Before Installation" instructions. Do not cut ground pin on Power Supply Cord (Male End) (11). Only use a properly grounded electrical outlet. Read and follow warning on page 1.

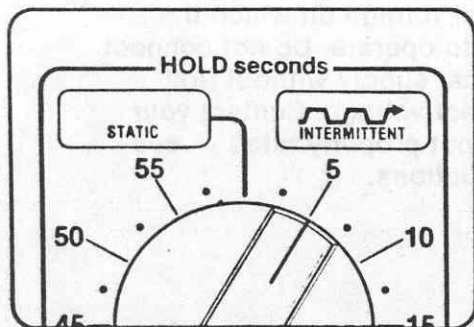
Do NOT disconnect the Power Supply Cord set to stop or interrupt treatment — see "How to Stop or Interrupt Treatment" instructions.



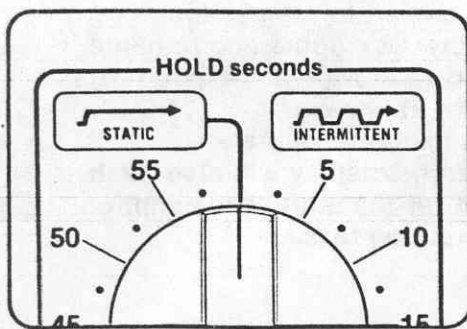
13. As a safety measure and to minimize any apprehension we recommend that you always give the low voltage Patient Interrupt Switch (13) to the patient. When the red button on the end of the switch is pressed, any applied tension automatically releases gradually. The operator may conveniently resume a patient interrupted treatment without the need to change control settings by turning the Power On/Off Switch (7) "OFF" and "ON" again. The Patient Interrupt Switch (13) also functions as a "call button" which enables the patient to audibly signal the operator for assistance whenever the red button is pressed.



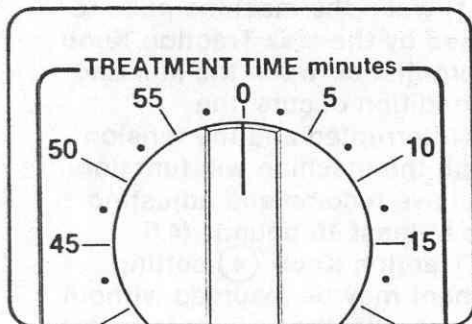
14. The Static Traction Mode Indicator (14) is a graphically displayed orange colored arrow which lights whenever the Hold Timer Knob (16) is turned to the setting marked STATIC (provided the power is connected and switched "ON"). During a static traction treatment, the machine will pull to and hold at the maximum force indicated by the Max Traction Knob (4) for the length of time indicated by the Treatment Timer Knob (17). (Note: If a sufficient differential has been provided between Min and Max settings, the Min Reset Knob (6) and Rest Timer Knob (18) settings will not affect the machine when operating in the static traction mode).



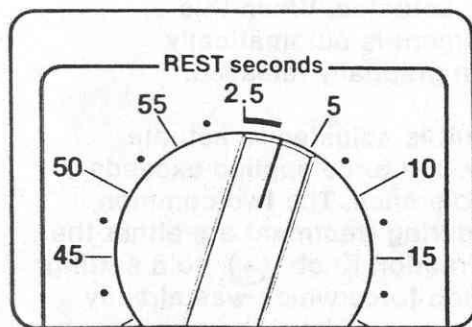
15. The Intermittent Traction Mode indicator (15) is a graphically displayed orange colored arrow which lights whenever the Hold Timer Knob (16) is turned to any setting other than the one marked STATIC (provided power is connected and switched "ON").



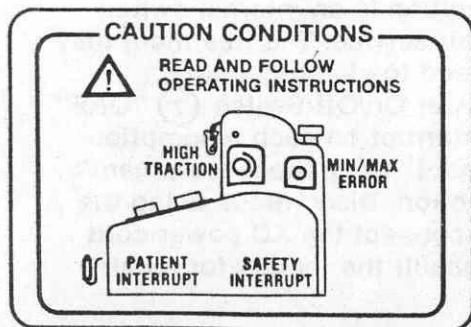
16. The Hold Timer Knob (16) is used to determine either the static traction mode, or the number of seconds to hold at the force indicated by the Max Traction Knob (4) during each cycle of the intermittent traction mode. During the hold phase of operation, the machine will automatically compensate for the normal loss of tension caused by harness stretch and patient movement. This "top-up" feature maintains the prescribed maximum traction force indicated by the Max Traction Knob (4) (Note: Although the Hold Timer setting may be changed at will, the new setting will not be recognized until the next cycle).



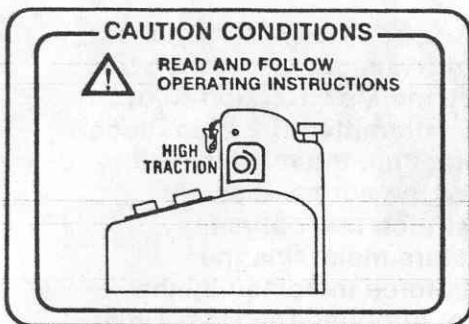
17. The Treatment Timer Knob (17) is used to start the treatment, determine its length in minutes, and to either stop or interrupt. Turn the knob so that its white indicator line corresponds to the desired length of treatment. The treatment timer is a mechanical clock that will "count down" to show the treatment time remaining plus automatically stop the treatment and ring a bell to signal the operator at zero. The treatment timer is the control used to start the treatment and the only one used by the operator to stop or interrupt treatment. After treatment timer reaches zero, wait until all tension has released automatically before using Cord Release Position (5) or removing harness from patient.



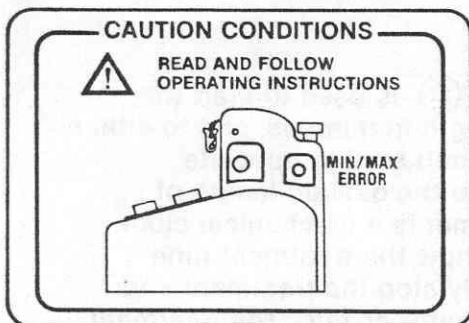
18. The Rest Timer Knob (18) is used to determine the number of seconds to rest at the force indicated by the Min Reset Knob (6) during each cycle of the intermittent traction mode. (Note: Although the rest timer setting may be changed at will, the new setting will not be recognized until the next cycle.)



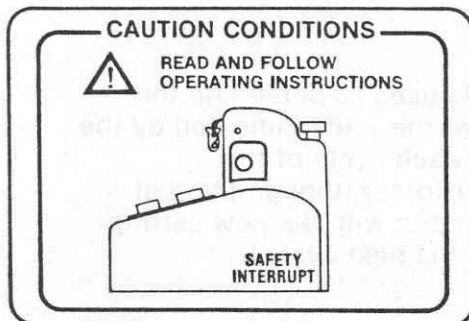
19. The Caution Conditions Section (19) of the instrument panel features four graphic displays which will light (provided power is connected and switched "ON") only upon the occurrence of a condition requiring the operator's attention.



20. As a caution reminder to the operator, the yellow colored High Traction Display (20) lights and remains lit whenever the Max Traction Knob (4) setting is increased to the high traction range above approximately 40 pounds (18 kilograms). As an additional caution reminder, the display will also flash and audibly signal five times at the start or resumption of a treatment in the high traction range.

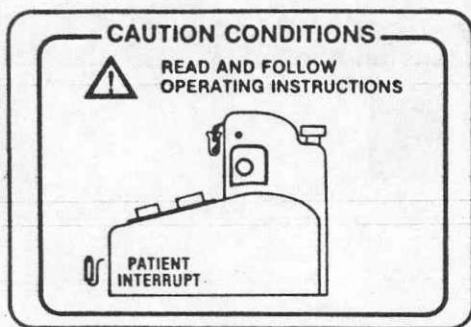


21. The yellow colored Min/Max Error Display (21) flashes and audibly signals the operator (in either static or intermittent traction modes) when the machine pulls to the maximum force indicated by the Max Traction Knob (4) without sufficient differential between the Min and Max settings. When this condition occurs, the treatment is automatically interrupted and the tension gradually releases. Although the machine will function normally at less differential, we recommend adjusting the Min Reset Knob (6) to at least 10 pounds (4.5 kilograms) below the Max Traction Knob (4) setting. After correction, the treatment may be resumed without the need to change other control settings by turning the Power On/Off Switch (7) "OFF" and "ON" again.

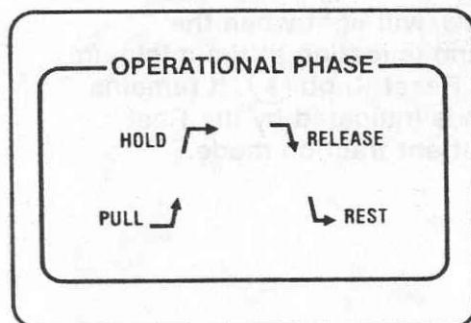


22. The red colored Safety Interrupt Display (22) flashes and audibly signals the operator when the machine's secondary safety circuit is actuated. When this condition occurs, the treatment is automatically interrupted and the tension gradually released.

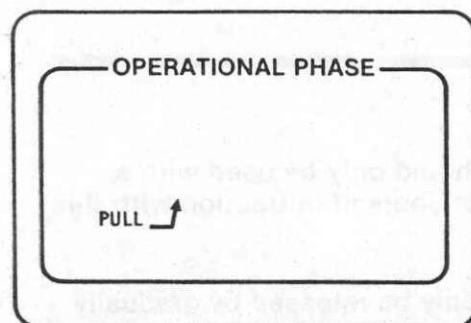
The secondary safety circuit is adjusted to actuate during treatment if the traction force applied exceeds the Max Traction setting tolerance. The two common causes for this condition during treatment are either the operator turned the Max Traction Knob (4) to a setting below the amount of traction force which was already applied, or the patient moved away from the machine in such a manner as to apply more traction force than was indicated by the Max Traction Knob (4). A third possible cause of the condition is an internal switch malfunction requiring repair service. The treatment may be resumed without the need to change control settings by turning the Power On/Off Switch (7) "OFF" and "ON" again. Safety interrupt on each resumption without "operator adjustment" or "patient movement" indicates a switch malfunction. Discontinue using the machine immediately. Disconnect the AC power cord from the AC outlet and consult the factory for repair service.



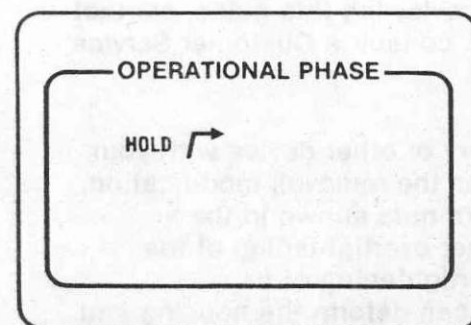
23. The yellow colored Patient Interrupt Display (23) flashes whenever the Patient Interrupt Switch (13) is actuated. The light continues to flash after the Treatment Timer Knob reaches zero to advise the operator that the patient may have interrupted the treatment prior to completion. A patient interrupted treatment may be resumed by turning the Power On/Off Switch (7) "OFF" and "ON" again.



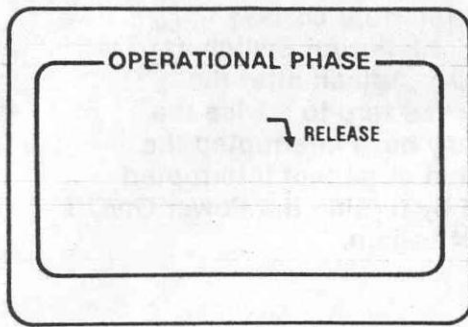
24. The Operational Phase Section (24) of the instrument panel features four orange colored displays that sequentially light during a treatment to advise the operator of the current operational phase status.



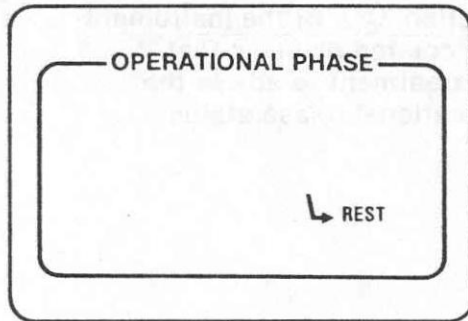
25. The Pull Phase Display (25) will light while the machine is increasing the tension applied either in static or intermittent traction modes.



26. The Hold Phase Display (26) will light when the machine has pulled to and is holding at the maximum force indicated by the Max Traction Knob (4). It either remains lit for the number of seconds indicated by the Hold Timer Knob (16) in intermittent traction mode, or for the length of time indicated by the Treatment Timer Knob (17) in static traction mode.



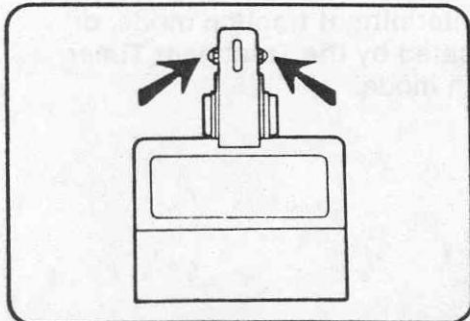
27. The Release Phase Display (27) will light while the machine is decreasing the tension applied in intermittent traction mode.



28. The Rest Phase Display (28) will light when the machine has released to and is resting at the minimum force indicated by the Min Reset Knob (6). It remains lit for the number of seconds indicated by the Rest Timer Knob (18) in intermittent traction mode.

RECOMMENDATIONS

- A. As with the safe use of any motorized equipment, your TRU-TRAC™ should only be used with a responsible adult in attendance. For that reason, do not attempt to put yourself in traction with this machine.
- B. In the event of a loss of power to the machine, traction force should **only** be released by gradually lengthening the patient harness adjustment straps. To prevent damage, **NEVER TURN MAX TRACTION KNOB (4) TO CORD RELEASE POSITION (5) WHILE TRACTION FORCE IS APPLIED TO BRAIDED TRACTION CORD (2).**
- C. If you are having difficulty operating your TRU-TRAC™ after carefully reviewing this guide, contact your supplier for assistance. If they are unable to resolve the problem, consult a Customer Service Representative at the factory.



- D. **DO NOT USE** any accessory or other device with your TRU-TRAC™ which requires the removal, modification, or replacement of the acorn nuts shown in the illustration to the left. Either overtightening of the original acorn nuts, or overtightening of any replacement/adaptor nuts can deform the housing and interfere with the safe and proper operation of the moving parts inside the housing of the TRU-TRAC™. Read and follow warning on page 1.

NOTE: The TRU-TRAC Brand "TD-9000" 3-Dimensional Cervical System may be an exception. If so, follow accompanying TD-9000 installation instructions carefully.

HOW TO START AND STOP OR INTERRUPT A TREATMENT

Traction treatments may be given only by or on order of a licensed practitioner. TRU-TRAC Therapy Products Inc. does not recommend the use of any specific traction force or timer settings. Any settings mentioned in the product instructions are for illustrative purposes only. Reprints of pertinent clinical studies and medical papers are available upon request without charge in either compendium or unabridged form.

- A. It is usually easier to align the harness on the patient while they are standing and then tighten the harness after positioning them relative to your TRU-TRAC™. Follow the fitting instructions supplied with the patient harness.
- B. Position the patient on the TRU-TRAC brand table or chair in accordance with the instructions supplied with those products. Note that the TRU-TRAC™ should be mounted facing the intended direction of pull so that the Braided Traction Cord (2) does not contact the side of the slot from which it extends.
- C. Tighten any slack in the harness so that it fits the patient securely.
- D. With the Max Traction Knob (4) set to Cord Release Position (5), slowly * pull the end of the Braided Traction Cord out and attach the Accessory Connector (3). The machine will automatically take up any slack in the Braided Traction Cord (2). *(Rapidly pulling the Braided Traction Cord (2) may cause internal tangling on the take-up spool.)
- E. Turn the Max Traction Knob (4) to the prescribed setting. Turn the Min Reset Knob (6) to the desired setting usually at least 10 pounds (4.5 kilograms) below the Max Traction Knob (4) setting.
- F. Move the Power On/Off Switch (7) to the "ON" position.
- G. Turn the Hold Timer Knob (16) to either the static traction mode, or the number of seconds of desired hold at the maximum traction force. If you are not using the static traction mode, turn the Rest Timer Knob (18) to the number of seconds of desired rest at the force indicated by the Min Reset Knob (6).
- H. Give the Patient Interrupt Switch (13) to the patient. If the patient is not already familiar with this switch's operation, an explanation and demonstration are recommended.
- I. Start the treatment by turning the Treatment Timer Knob (17) to the desired treatment length in minutes. Stop or interrupt the treatment by turning the Treatment Timer Knob (17) to zero and waiting until all tension has released automatically before using Cord Release Position (5) or removing harness from patient.

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TROUBLE-SHOOTING GUIDE

Use this guide to help identify the problem with the traction unit. In the event you are still unable to identify or repair the problem, consult the Customer Service Dept. at the factory for additional information. Refer to the Control Reference Guide.

A. Machine will not pull and neither Static nor Intermittent Mode Indicator (14) or (15) is lit:

1. Power Supply Cord (Male End) (11) is not connected to electrical outlet.
2. Electrical outlet is not operable - try connecting another electrical appliance known to be in an operable condition (such as a lamp) to the same outlet to check this possibility. Check circuit breaker or fuse at building power panel.
3. If your electrical outlet is fitted with a GFI (ground fault interrupt) device, it may need to be reset.
4. Power Supply Cord (Female End) (12) is not fully engaged in Power Supply Receptacle (8).
5. Power On/Off Switch (7) is turned "OFF".

B. Machine will not pull and either Static or Intermittent Traction Mode Indicator (14) or (15) is lit:

1. Max Traction Knob (4) is in Cord Release Position (5).
2. Treatment Timer Knob (17) is set at zero or not first turned past "5" minutes before setting to less than "5" minutes.
3. The number of seconds indicated by the Rest Timer Knob (18) have not elapsed.
4. The Rest Timer Setting was changed and the new setting will not be recognized until the next traction cycle.
5. A Min/Max Error, Safety Interrupt, or Patient Interrupt has occurred as indicated by lit displays (21), (22), or (23).
6. If your machine is a TT-92LV model which was upgraded to the TT-92B configuration, the Patient Interrupt Switch (13) and cord assembly may be unplugged or not fully inserted into its receptacle.
7. The Braided Traction Cord (2) is extended from the slot to its full length - allow some of the cord to retract back into the unit and use a Catalog Number PT-110 Line-Tite Clamp with traction cord extension.

C. Machine will pull but not release.

1. Hold Timer Knob (16) is set for Static Traction.

2. The number of seconds indicated by the Hold Timer Knob (16) have not elapsed.
3. The Hold Timer setting was changed and the new setting will not be recognized until the next traction cycle.
4. The circuit breaker feature has turned the "Power On/Off Switch" (7) "Off".
5. There has been a loss of power to the machine - see possible causes following problem "A" above.
6. Another apparatus such as short wave diathermy is in use too near the traction machine and is affecting its timer.

D. Machine pulls repeatedly while in Hold Phase.

1. Machine is automatically taking up normal mid-treatment slack due to harness stretch or patient movement - see description of Hold Timer Knob (16) under "OPERATING CONTROLS AND FEATURES" in the Operating Instructions for details on the "Top-up" feature.

SECTION I

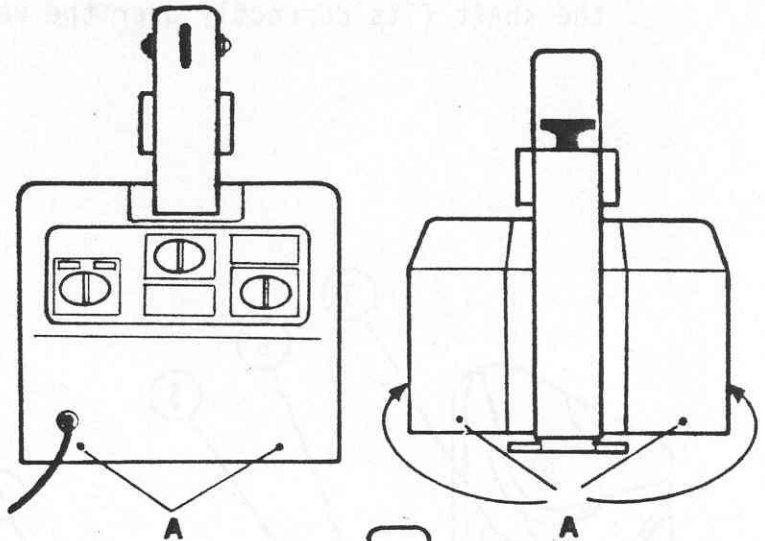
ILLUSTRATION 1-1

REMOVING COVER

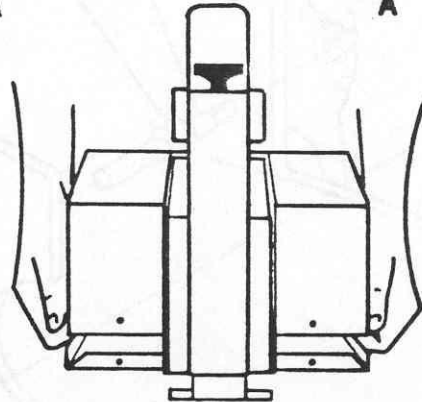
WARNING: DISCONNECT ALL POWER TO THE UNIT BEFORE SERVICING.

Be aware of all input voltage wiring, terminals and connections.
Use caution when operating traction machine with the cover removed.

- A. Remove six screws "A".



- B. Raise back of cover enough to get a hand under each side of the rear of cover.



- C. Pull upward and at the same time pull forward in a rolling motion. Disconnect wire harness plugs B, C, D as they become accessible.

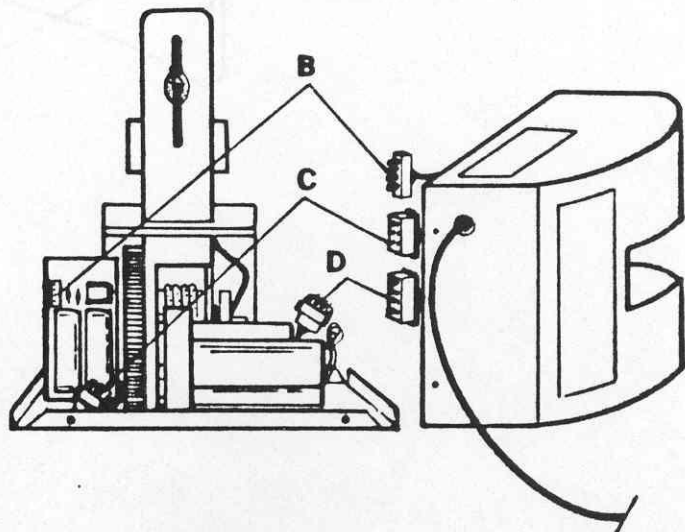
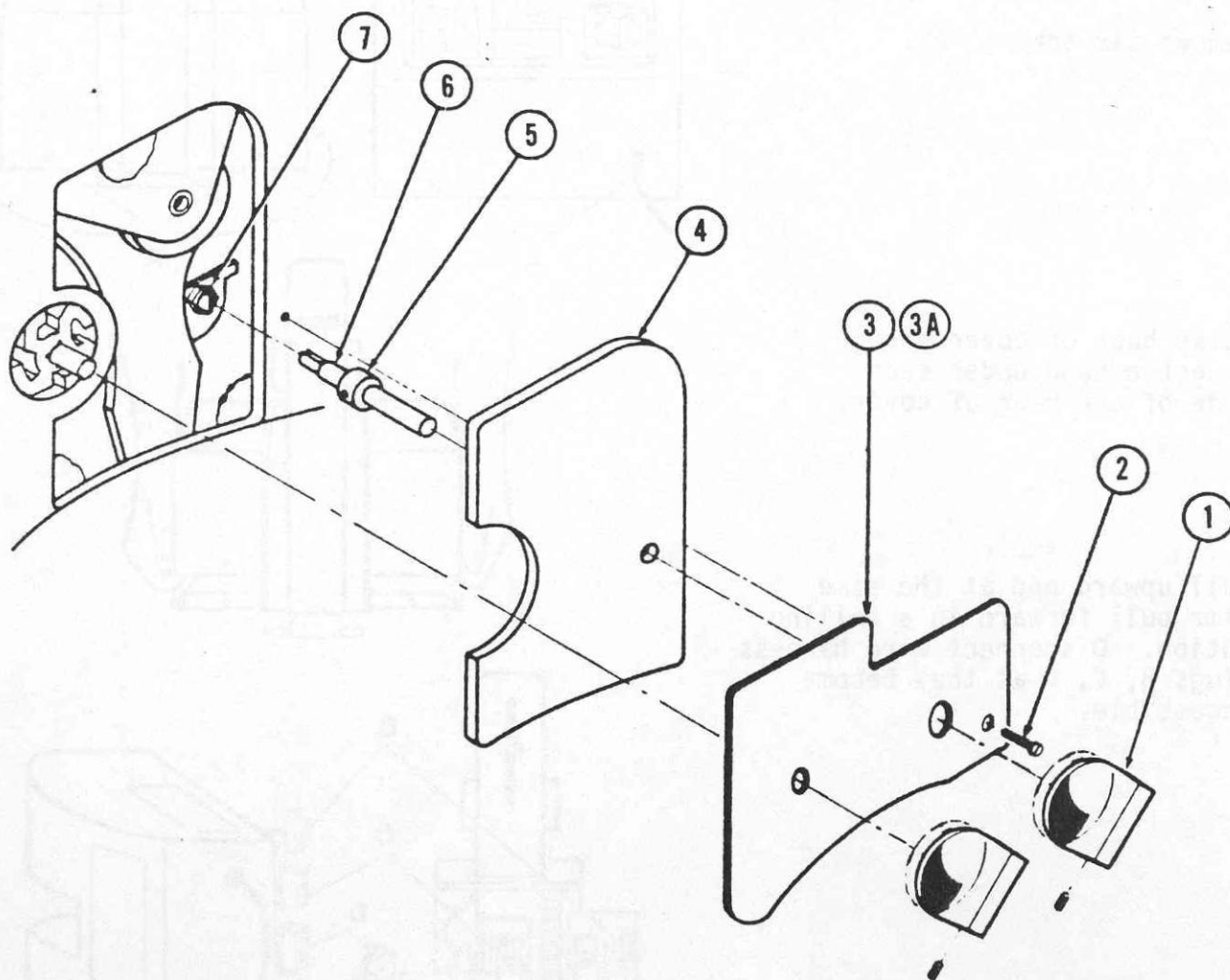


ILLUSTRATION 1-2

REMOVING MAIN CASTING COVER PLATE

Remove items 1 through 6.

Note: Do not remove #5 from #6. It is factory adjusted for correct position. When installing item #6 be sure the slotted end of the shaft fits correctly over the Reset Arm Pivot Shaft (7).



MAIN CASTING COVER PLATE PARTS LIST

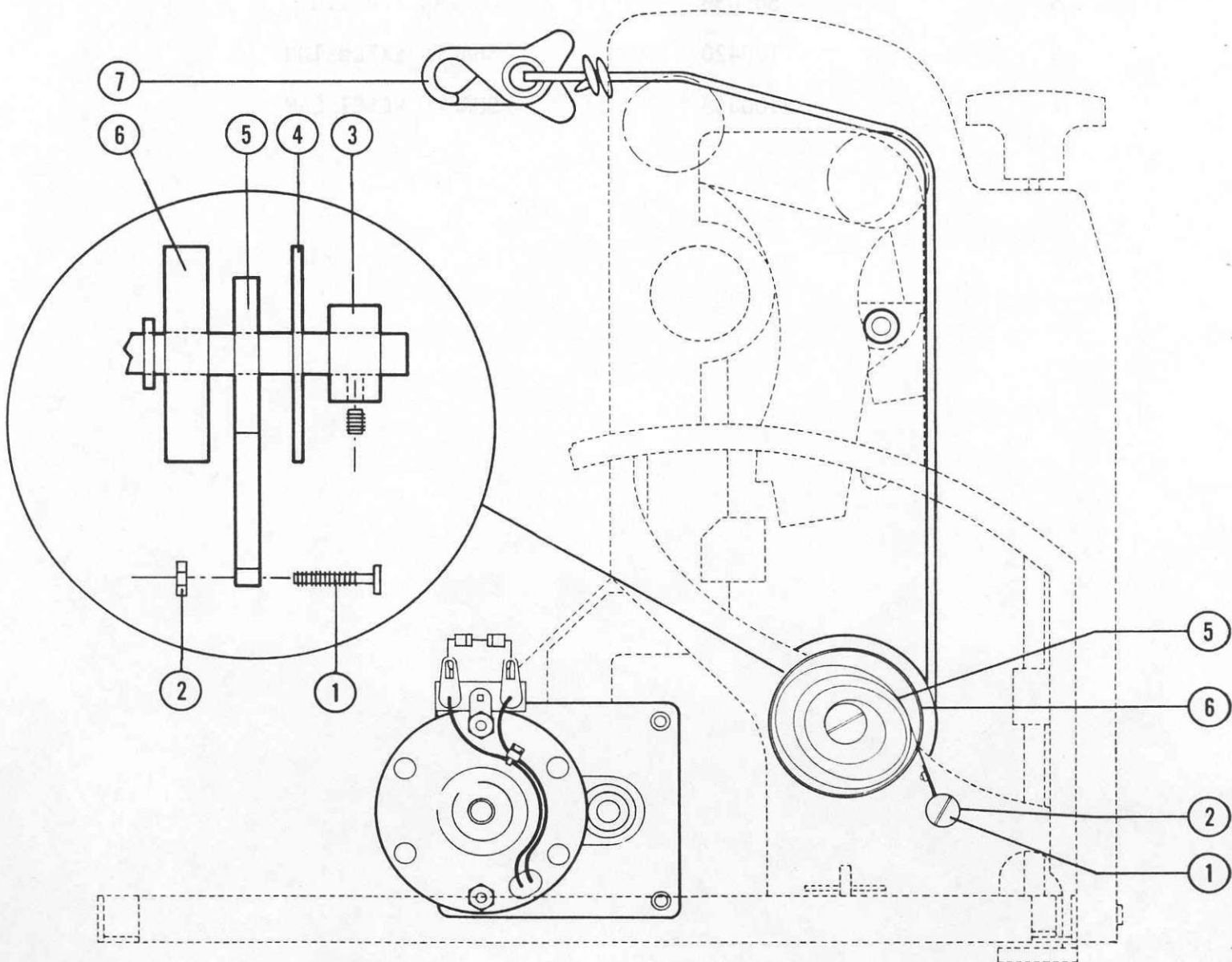
<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	601262A	INDICATOR KNOB WITH FELT
2	201068	SCREW, 4-40 x 1/8 "
3	100803A	DIAL (POUNDAGE/KILOGRAM) RIGHT SIDE
3A	100824A	DIAL (KILOGRAMS ONLY) RIGHT SIDE
4	N/A	COVER PLATE
5	509036	COLLAR 1/4 I.D.
6	100420	SHAFT, EXTENSION
7	100368	SHAFT, RESET CAM

ILLUSTRATION 1-3

REMOVING REWIND SPRING

1. Remove spring hold-down screw and nut (1, 2), set collar (3), rewind spring retainer (4), spring (5) and spring cup (6).

Note: When reinstalling rewind spring, be sure to wind the spring and spring cup to provide enough tension to pull the accessory connector (7) up to the opening in the casting then secure the spring with the hold-down screw and nut (1 & 2).



REWIND SPRING PARTS LIST

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	201127	SCREW 10-32 x 3/4"
2	202003	NUT 10-32
3	509003	SET COLLAR 1/2" I.D.
4	203062	SPRING RETAINER WASHER
5	100453	REWIND SPRING
6	100461	SPRING CUP
7	600390	ACCESSORY CONNECTOR

ILLUSTRATION 1-4

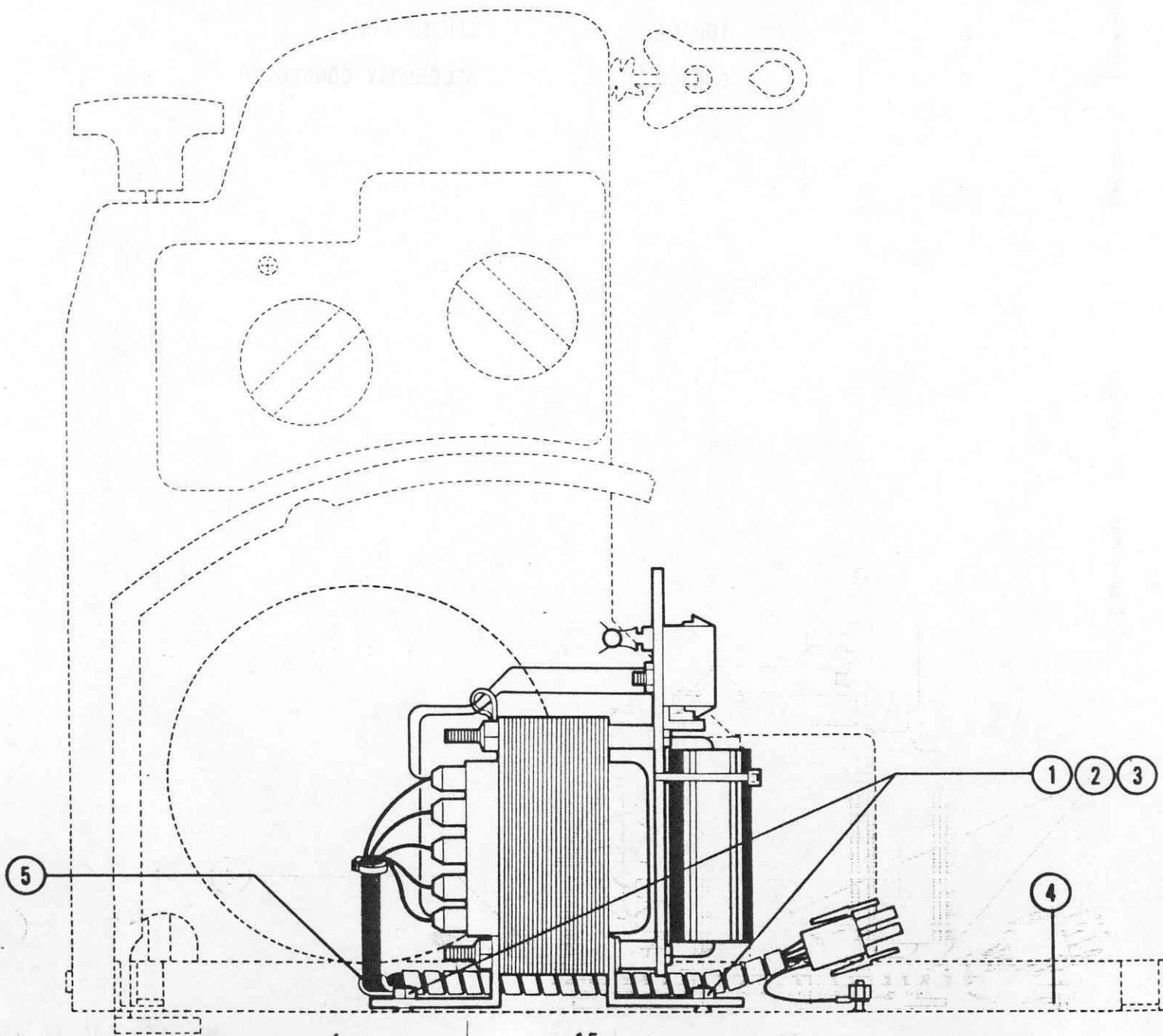
REMOVING POWER SUPPLY

Remove items 1, 2, 3 in five places and lift power supply from bottom pan (12).

Note: 1. Item 1 may be a press-stud in which case it should not be removed.

2. Be sure during installation of the power supply that the wire harness is secured by the "P" Clip (5) and that all wires are kept clear of any moving parts.

3. Be sure ground wire (green/yellow stripe) is secured to a clean ground stud and grounding continuity is verified.



POWER SUPPLY PARTS LIST

(See Illustration 2-3 and Page 29 for Power Supply components)

ITEM	PART#	DESCRIPTION
1	201013	SCREW 8-32 x 1/2"
1A	N/A	PRESS STUD
2	203065	WASHER #8 FLAT
3	202040	NUT 8-32 Hex
4	100356	BOTTOM PAN
5	207029A	P-CLIP 1/4" x 3/8"

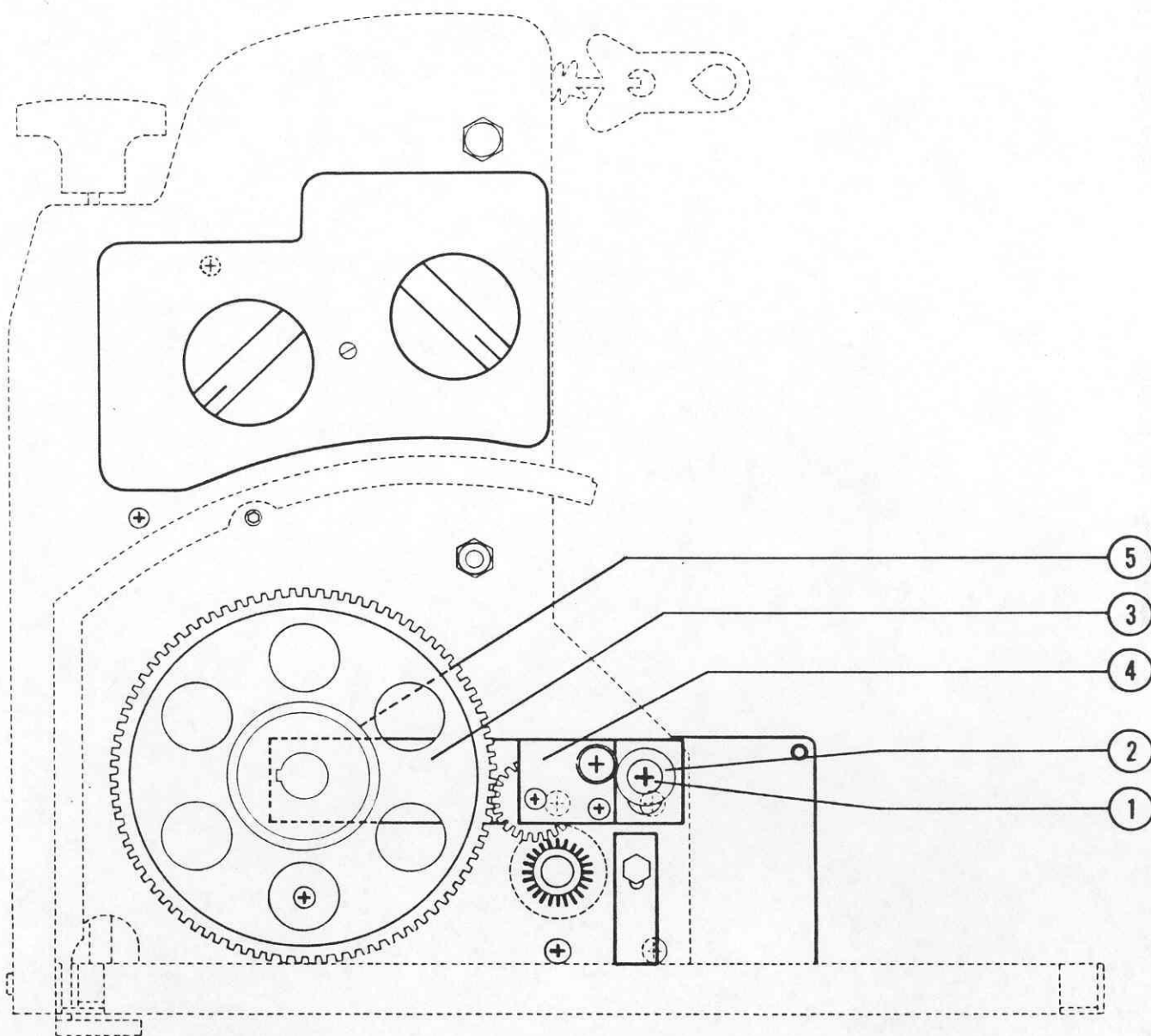
ILLUSTRATION 1-5

REMOVING MAIN GEAR ASSEMBLY

Remove screw (1) and shoulder washer (2). Remove the main gear assembly (3) and the idler gear arm assembly (4) by tapping the slotted end of the main drive shaft with a plastic mallet. Pull the assemblies clear of the casting and remove the rope drum (5).

Note: 1. When reinstalling the main gear and idler assemblies (3 & 4), be sure the idler gear arm (4) fits over the bearing as shown in Illustration 1-5A.

Refer to "Note", Illustration 1-6 for gear spacing instructions.



MAIN GEAR ASSEMBLY PARTS LIST

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	201002	SCREW 1/4" x 20 x 5/8"
2	100372C	SHOULDER WASHER
3	601510	MAIN GEAR ASSEMBLY
4	600512	IDLER GEAR ARM ASSEMBLY
5	100025	ROPE DRUM



ILLUSTRATION 1-5A

1. Move idler arm back until it fits over flange of casting bearing.
2. Push main gear up against flange of bearing to secure the idler arm in position.
3. Secure main gear with set collar on opposite side of casting.
See Illustration 1-3 Page 13

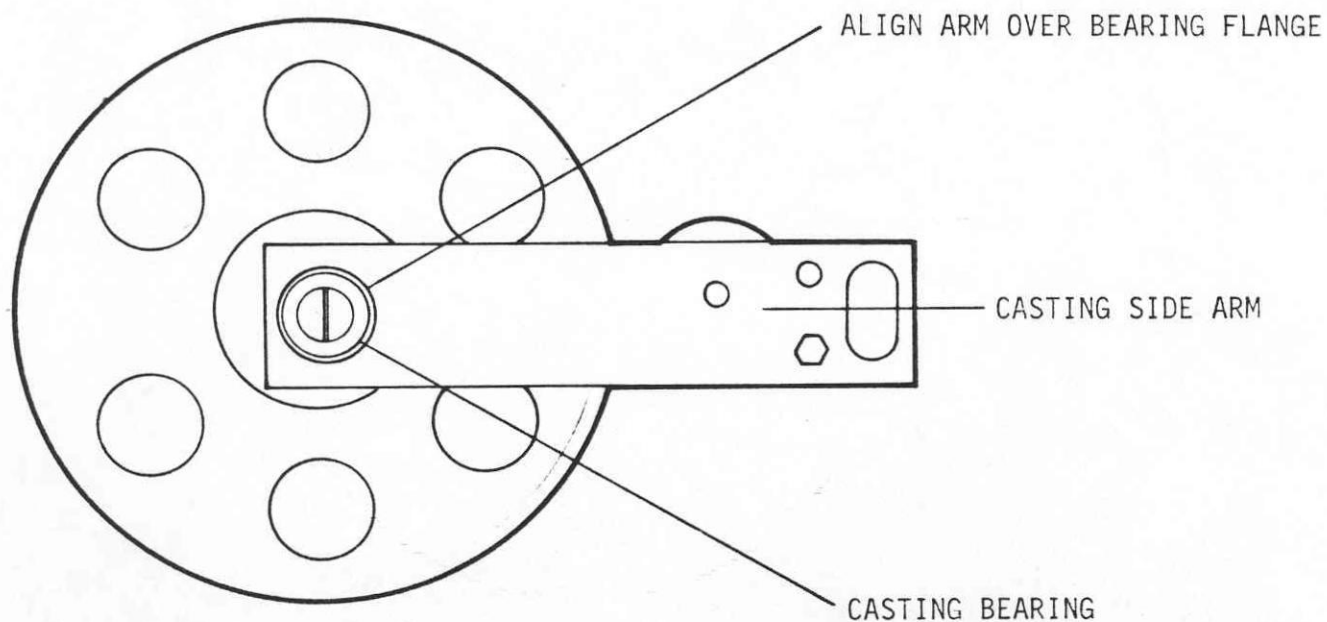


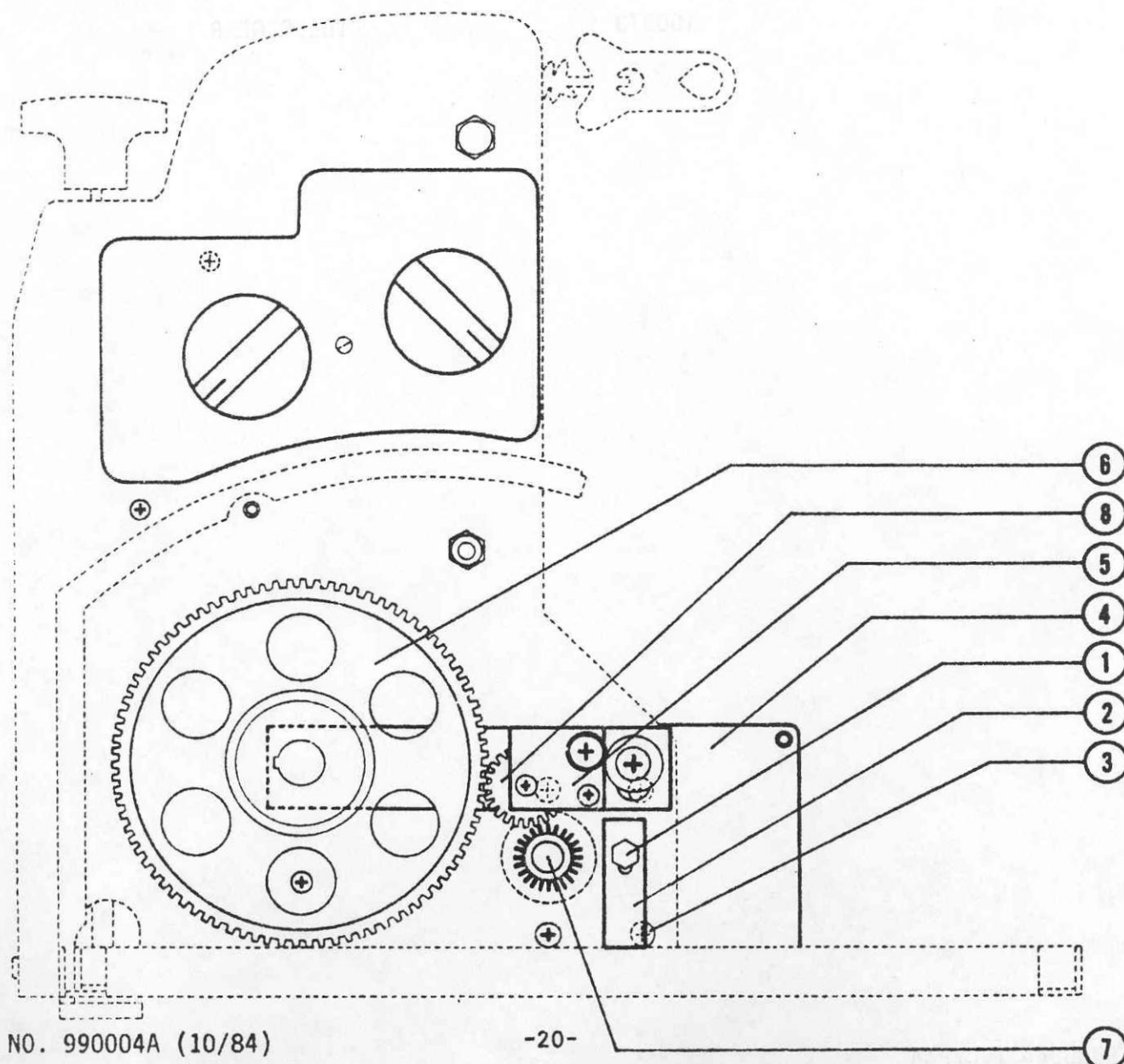
ILLUSTRATION 1-6

REMOVING MAIN DRIVE MOTOR (3)

Remove items 1 & 2. Remove each of four motor mounting screws (3) and remove motor (4). Be sure to note the wire locations and colors before disconnecting them. Always reconnect the blue harness wire to the red motor lead and the red harness wire to the black motor lead.

Note: Whenever the motor (4), idler gear arm assembly (5), main gear assembly (6) or the motor gear (7) is removed, the "backlash" or spacing between the gears must be reset:

Place a piece of regular bond paper between the idler gear (8) and the motor gear (7). Push the idler arm (5) down until paper is fully pressed into gear teeth. Move idler arm adjustment bracket (2) up until it meets with the bottom of the idler gear arm (5) and secure with screw (1). Remove paper strip.



MAIN DRIVE MOTOR PARTS LIST

<u>ITEM</u>	<u>PART#</u>	<u>DESCRIPTION</u>
1	201155	SCREW 10-32 x 1/2 "
2	100339	IDLER ARM ADJUSTMENT BRACKET
3	201013	SCREW 8-32 x 1/2"
4	601400	MOTOR
5	600512	IDLER ARM ASSEMBLY
6	601510	MAIN GEAR ASSEMBLY
7	100388	MOTOR GEAR WITH BEARING
8	100373	IDLER GEAR

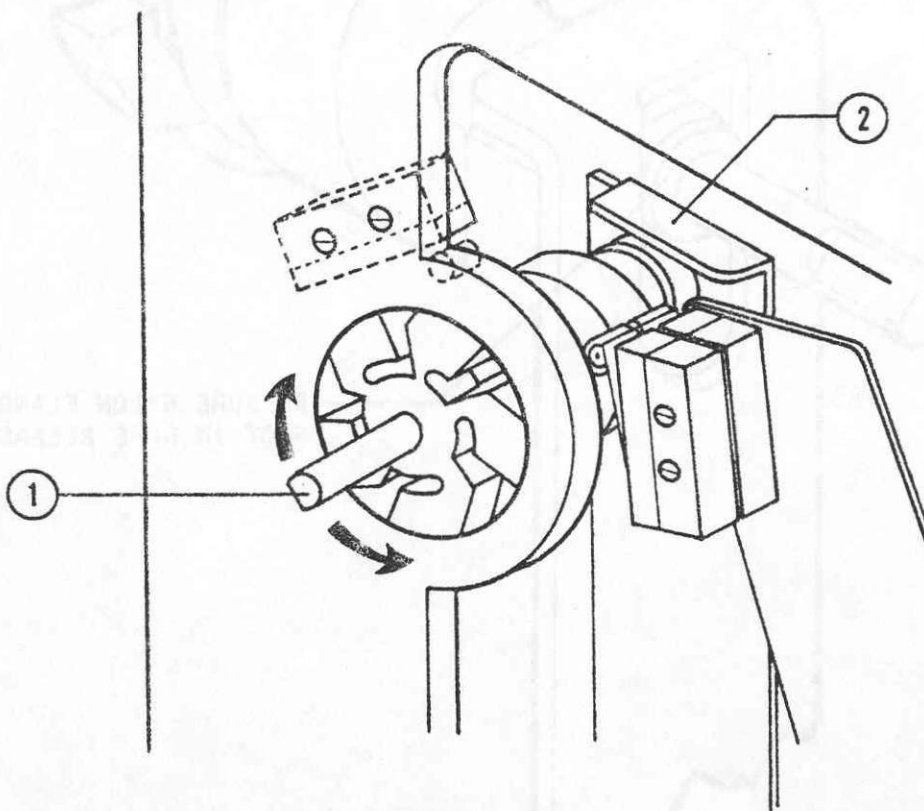
ILLUSTRATION 1-7

REMOVING FORCE ADJUSTMENT CAM ASSEMBLY

1. Remove traction force indicator knob from left side of casting. Push cam assembly (1) out of casting.

CAUTION: Rotate the cam assembly (1) to clear all switches during removal. Avoid catching the cam assembly on any of the switch paddles during removal or replacement.

When re-installing the cam assembly, be sure the cam correctly seats into the rope release arm (2) See Illustration 1-7A, page 23



FORCE ADJUSTMENT CAM ASSEMBLY PARTS LIST

<u>ITEM</u>	<u>PART#</u>	<u>DESCRIPTION</u>
1	601330	TRACTION FORCE CAM ASSEMBLY
2	100022I	ROPE RELEASE ARM

ILLUSTRATION 1-7A

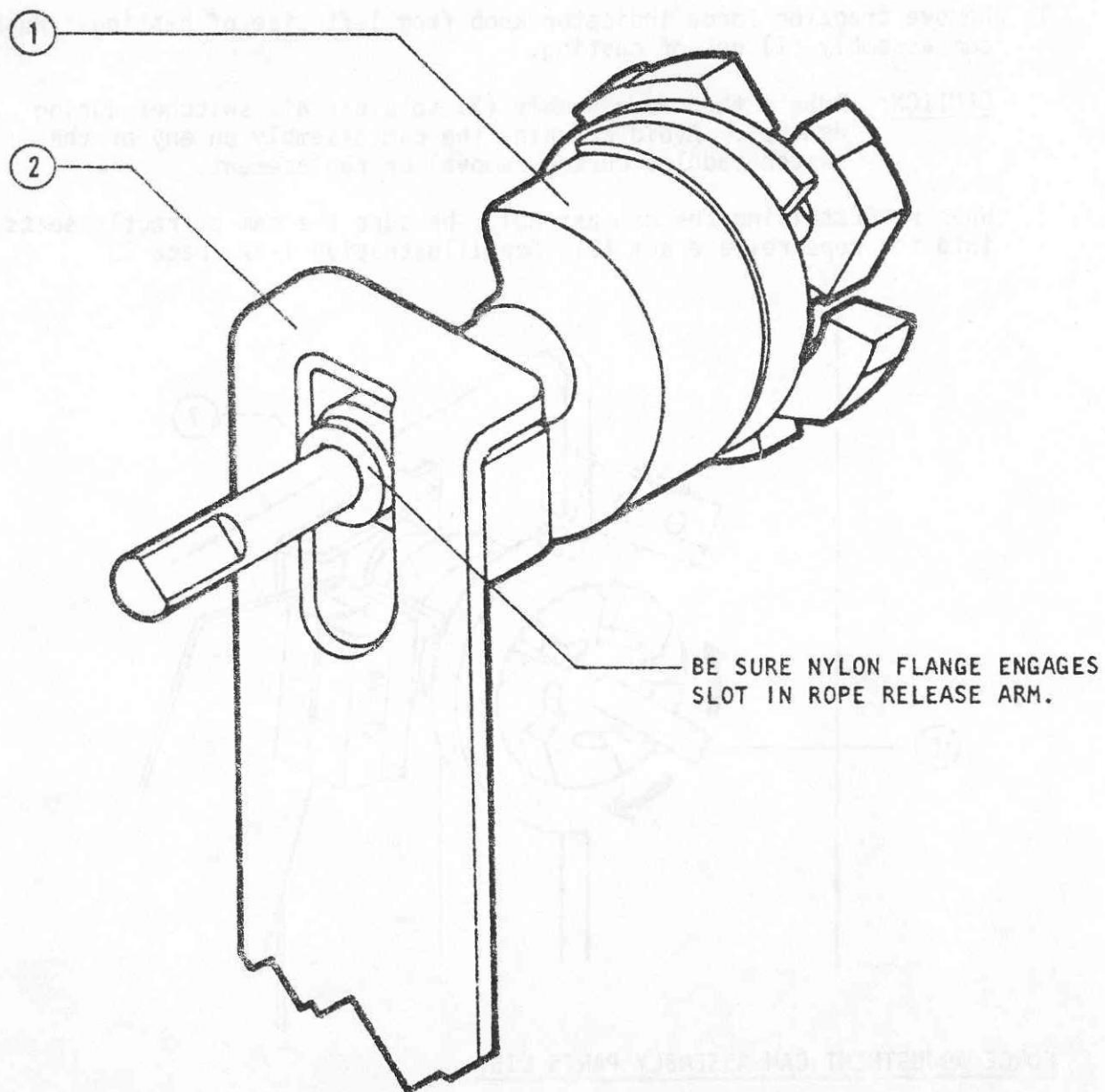


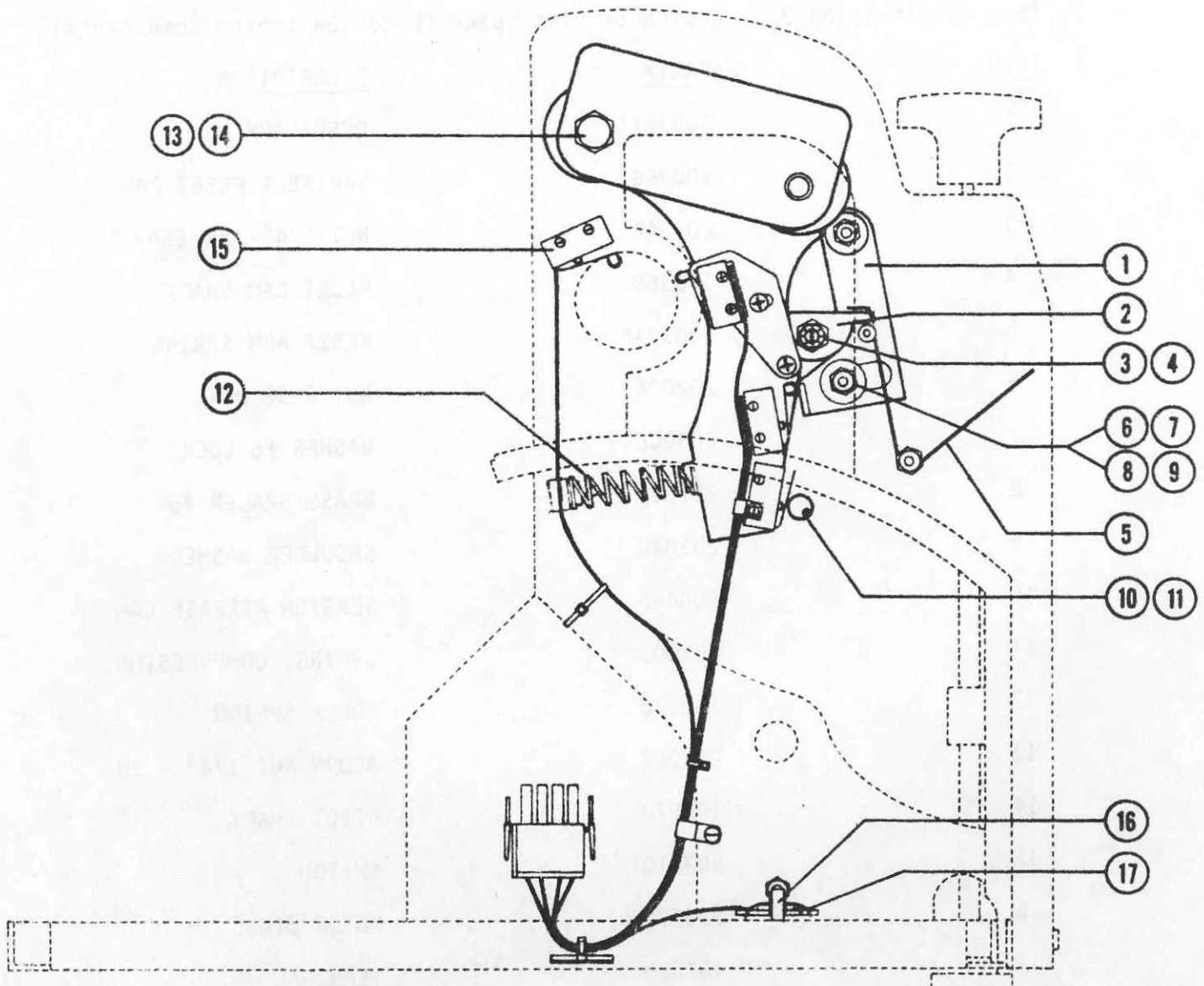
ILLUSTRATION 1-8

REMOVING SWITCHARM ASSEMBLY

1. Remove the Reset Arm (1) and Reset Cam (2): Remove the nut (3), cam (2) and shaft (4).

Note: When reinstalling cam shaft (4) screw the shaft into the casting to the same depth as originally set.

2. Unhook the reset arm spring (5) from the roller on the reset arm spring. Remove nut (6) washer (7) brass spacer (8) plastic shoulder washers (9) and screw from each end of reset arm.
3. Remove tension release cam (10) and spring (11). Remove force spring (12) and force spring adjustment button.



4. Remove acorn nuts (13) and switcharm pivot shaft (14).

WARNING: DO NOT USE any accessory or other device with your TRU-TRAC™ which requires the removal, modification, or replacement of the acorn nuts shown in the illustration. Either overtightening of the original acorn nuts, or overtightening of any replacement/adaptor nuts can deform the housing and interfere with the safe and proper operation of the moving parts inside the housing of the TRU-TRAC™.

5. Drop the switcharm assembly down and guide lower end out of casting taking care not to damage the switch paddles.
6. If it is necessary to remove the entire switcharm wiring harness, remove the high traction alarm switch (15) motor diode (16) terminal (17) and any cable ties or wire mounts present.

SWITCHARM ASSEMBLY PARTS LIST

(See Illustration 2-1 and Parts List, page 31 for Switcharm components)

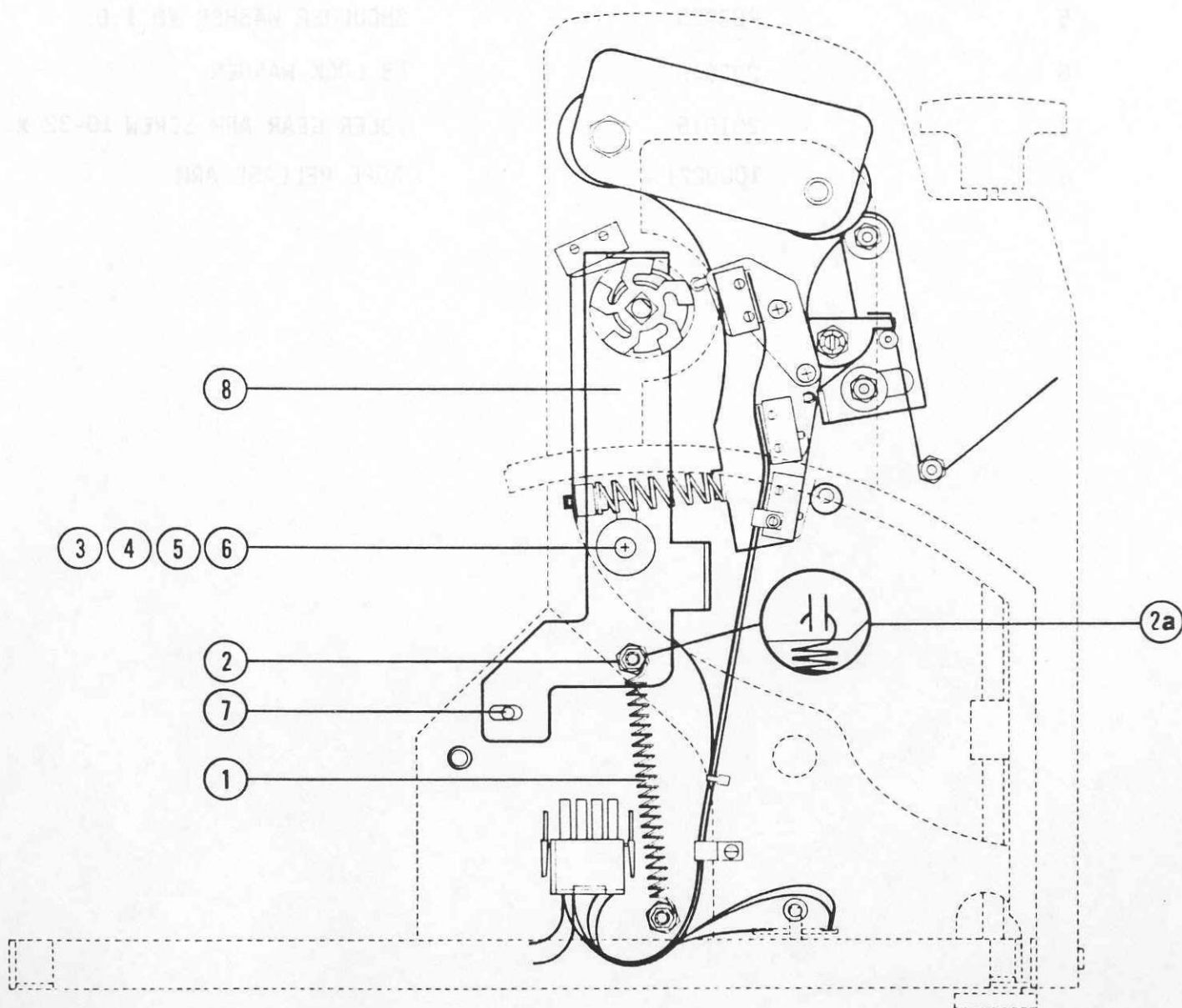
<u>ITEM</u>	<u>PART#</u>	<u>DESCRIPTION</u>
1	100367	RESET ARM
2	100366	VARIABLE RESET CAM
3	202044	NUT 1/4" - 28 ESNA
4	100368	RESET CAM SHAFT
5	100394B	RESET ARM SPRING
6	202004	NUT 6-32 HEX
7	203006	WASHER #6 LOCK
8	207016	BRASS SPACER #6
9	203040	SHOULDER WASHER
10	600440	TENSION RELEASE CAM
11	503001	SPRING, COMPRESSION
12	100176	FORCE SPRING
13	202002	ACORN NUT 1/4" - 28
14	100020	PIVOT SHAFT
15	403010	SWITCH
16	310110	MOTOR DIODE
17	407025	TERMINAL

ILLUSTRATION 1-9

REMOVING ROPE RELEASE ARM (6)

Disconnect spring (1) from tab (2A) or threaded stud (2) on rope release arm (6). Remove screw (3) nut (4) and two plastic shoulder washers (5).

Note: When reinstalling arm, be sure arm moves freely and screw (7) goes through slot in arm. No nut is required on the end of screw (7).



ROPE RELEASE ARM PARTS LIST

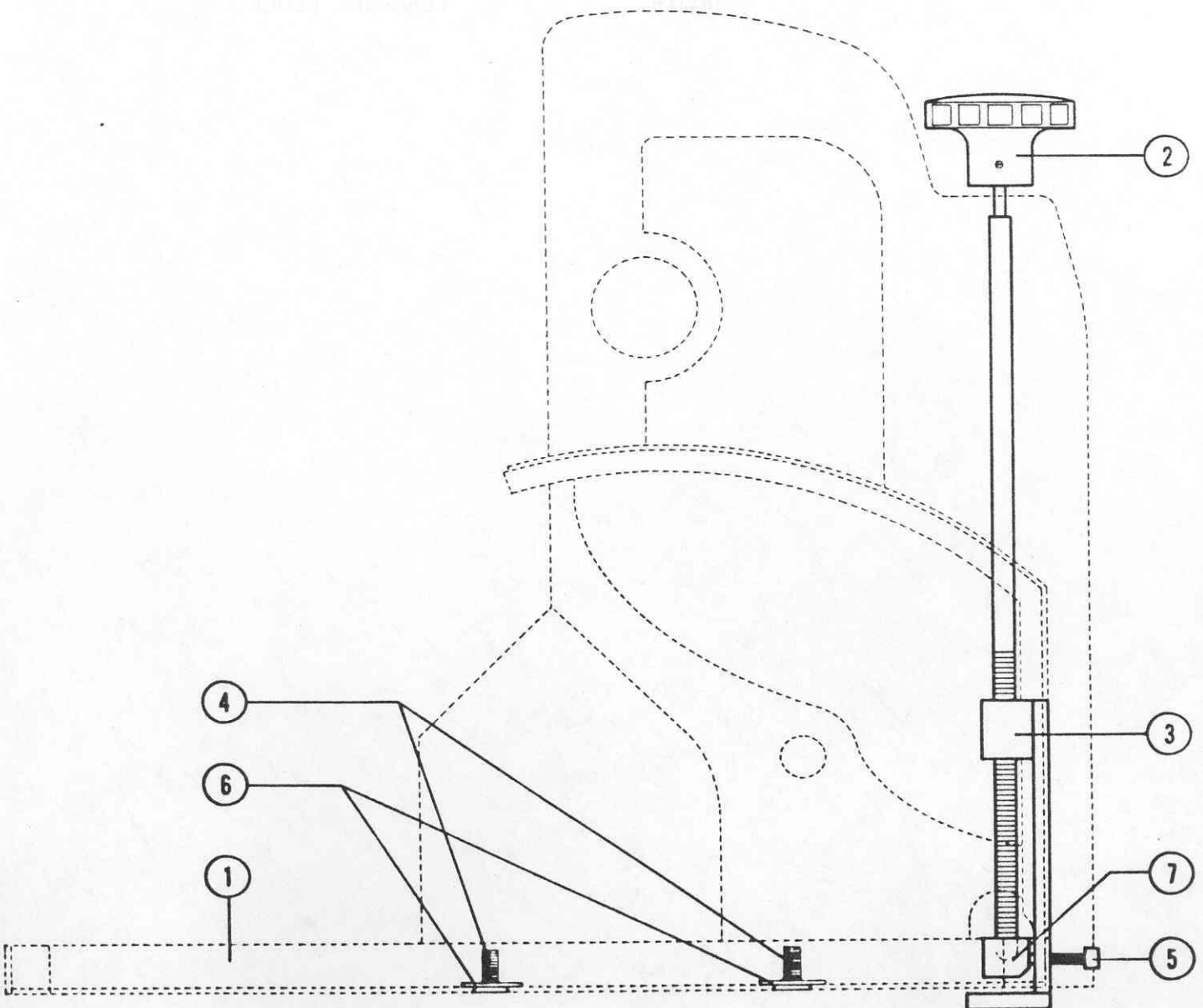
<u>ITEM</u>	<u>PART#</u>	<u>DESCRIPTION</u>
1	503002	ROPE RELEASE ARM SPRING
2	N/A	PRESS STUD
2A	N/A	SPRING TAB
3	201085	SCREW 8-32 x 3/4"
4	203055	NUT 8-32 HEX
5	203025	SHOULDER WASHER #8 I.D.
6	202040	#8 LOCK WASHER
7	201015	IDLER GEAR ARM SCREW 10-32 x 1/8"
8	100022I	ROPE RELEASE ARM

ILLUSTRATION 1-10

REMOVING BOTTOM PAN

Turn knob (2) to loosen (extend) clamping bracket (3). Remove screws (4) in two places and (5) in two places. The main casting can now be removed from the bottom pan (1).

Note: There may be one or more washers (6) between the casting and the bottom pan. These are used for spacing and should be replaced. Be sure to set clamping block (7) into place as shown for reassembly.



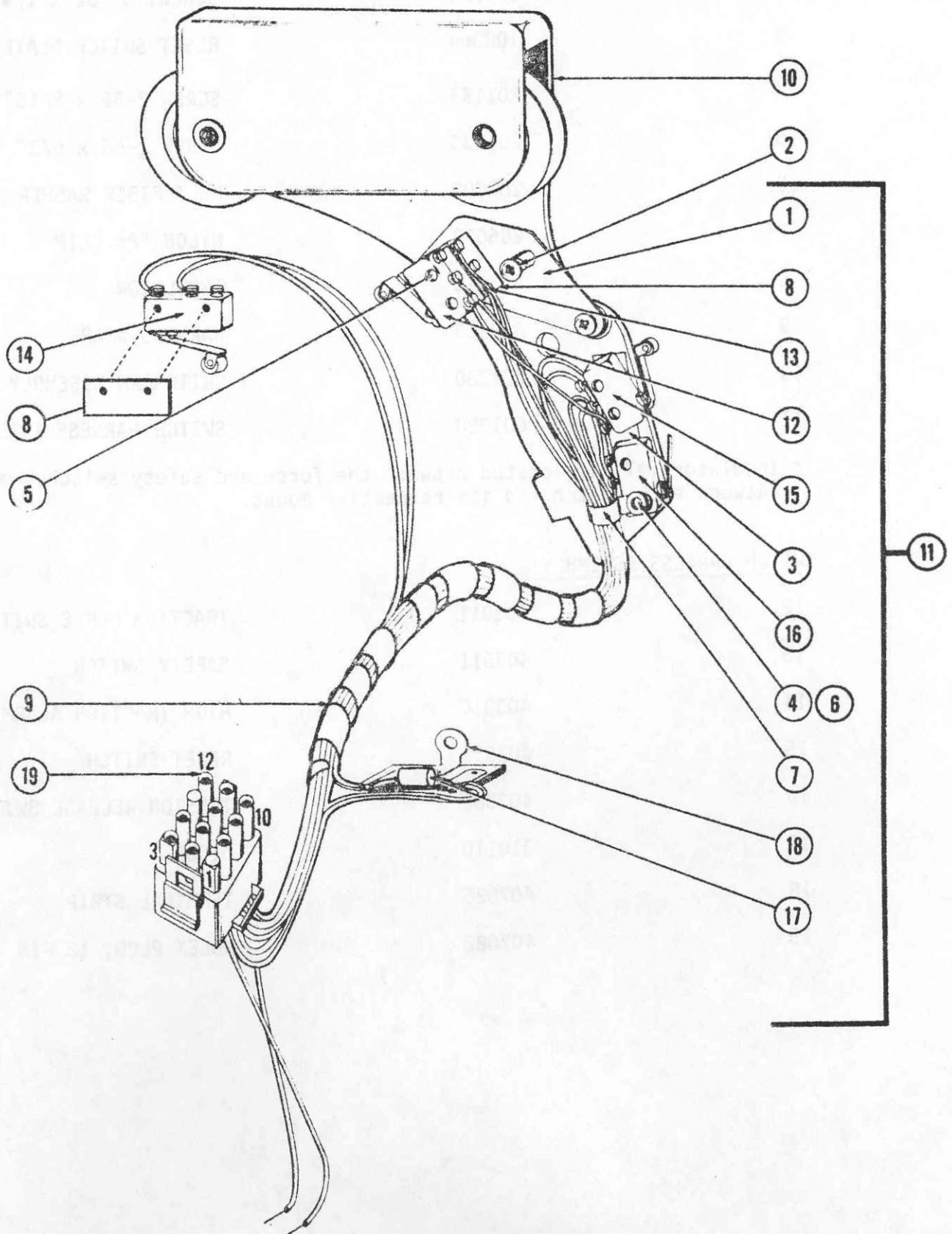
BOTTOM PAN PARTS LIST

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	100356	BOTTOM PAN
2	502031A	CLAMPING KNOB
3	600420	CLAMPING BRACKET & SHAFT
4	201017	SCREW 1/4"- 20 x 5/8 "
5	201016B	SCREW 8-32 x 1"
6	203053	WASHER 3/8" I.D.
7	100015	CLAMPING BLOCK

SECTION II

ILLUSTRATION 2-1

SWITCHARM ASSEMBLY



SWITCHARM ASSEMBLY PARTS LIST

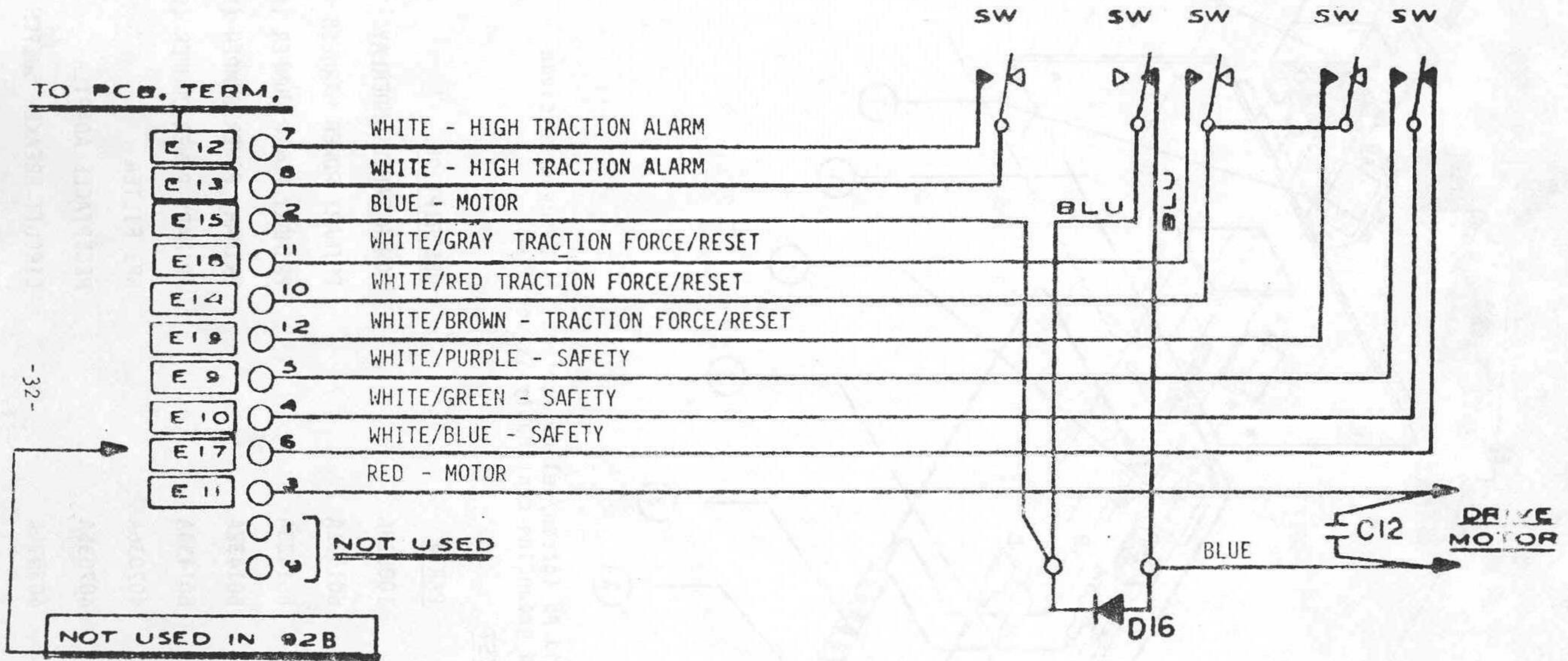
<u>ITEM</u>	<u>PART#</u>	<u>DESCRIPTION</u>
1	100365	TRACTION FORCE SWITCH PLATE
2	201124	SCREW, 6 - 32 x 1/4"
3	100364	RESET SWITCH PLATE
4	201133	SCREW 2-56 x 5/16"
5	201134	SCREW 2-56 x 5/8"
6	203009	FELT FIBER WASHER
7*	206033	NYLON "P" CLIP
8	403016	INSULATOR
9	408123	HARNESS WRAP
10	601380	SWITCHARM ASSEMBLY
11	601390	SWITCH HARNESS ASSEMBLY

* Insulator (#7) is located between the force and safety switches and between each switch and its respective mount.

SWITCH HARNESS ASSEMBLY

12	403011	TRACTION FORCE SWITCH
13	403011	SAFETY SWITCH
14	403010	HIGH TRACTION ALARM SWITCH
15	403011	RESET SWITCH
16	403002	TENSION RELEASE SWITCH
17	310110	DIODE
18	407025	TERMINAL STRIP
19	407022	MOLEX PLUG, 12 PIN

SWITCHARM HARNESS SCHEMATIC



3 D 6 7 O 12
 2 O 5 8 D 11
 1 D 4 7 O 10

ILLUSTRATION 2-2

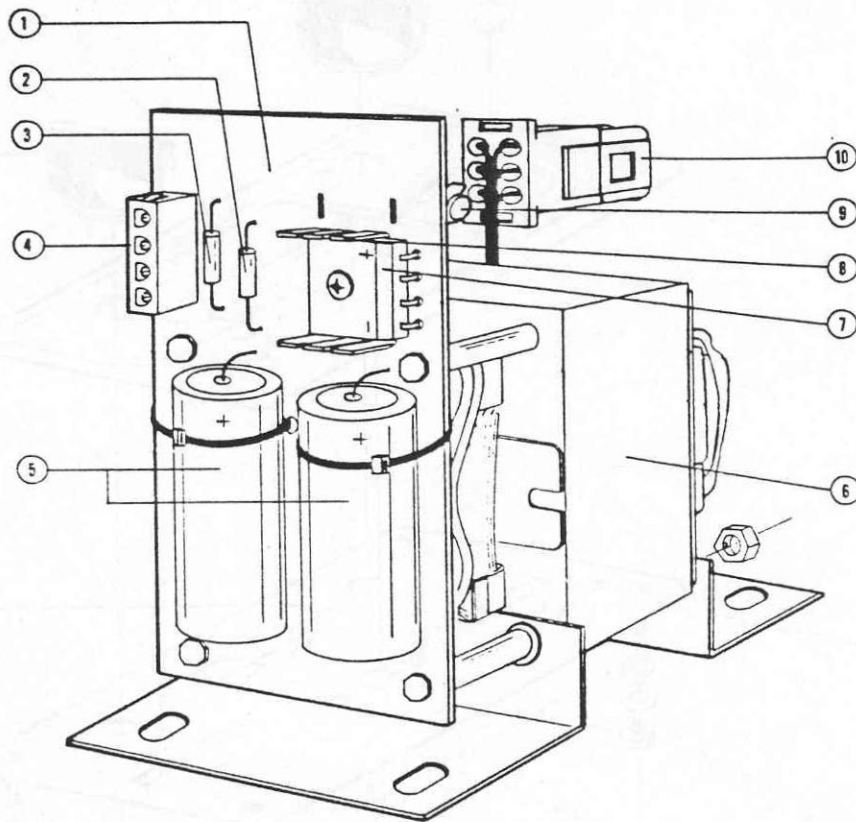
This exploded view diagram illustrates the assembly of a cable assembly. The components are numbered as follows: 1. A rectangular metal plate with mounting holes. 2. A cable with a braided shield and a multi-pin connector. 3. A small rectangular component, possibly a filter or ferrite bead, mounted on the cable. 4. A small rectangular component, possibly a filter or ferrite bead, mounted on the metal plate. 5. A multi-pin connector at the end of the cable. 6. Screws used to secure the metal plate and components. 7. A small rectangular component, possibly a filter or ferrite bead, mounted on the metal plate. 8. A small rectangular component, possibly a filter or ferrite bead, mounted on the metal plate. The diagram shows the cable (2) being inserted into the metal plate (1) and secured with screws (6). The various filter components (3, 4, 7, 8) are shown being mounted onto the cable and the plate. The multi-pin connector (5) is shown at the end of the cable.

POWER PANEL PARTS LIST

NO. 990004A (10/84)

ILLUSTRATION 2-3

POWER SUPPLY

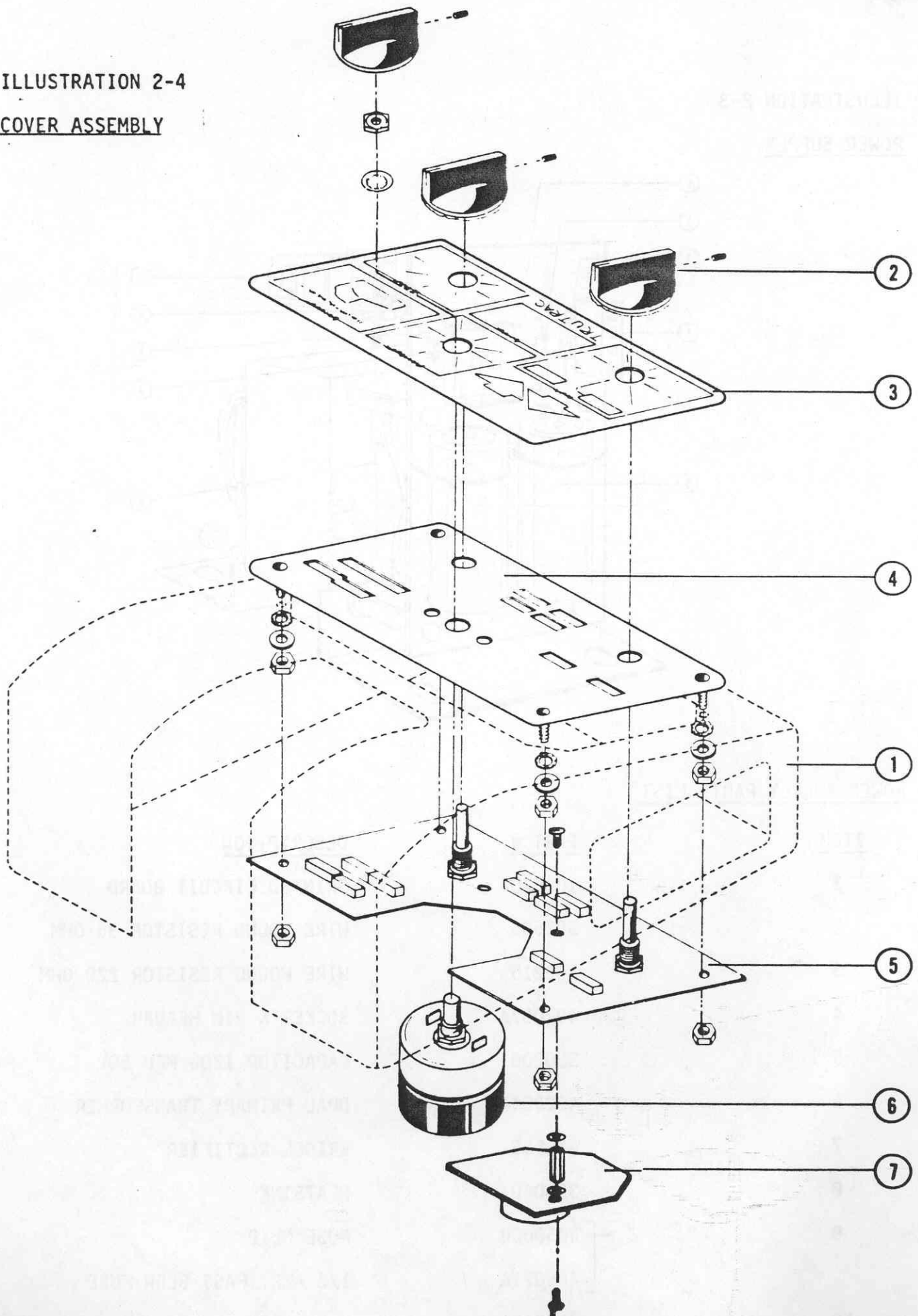


POWER SUPPLY PARTS LIST

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	100820A	PRINTED CIRCUIT BOARD
2	303505	WIRE WOUND RESISTOR 35 OHM
3	302215	WIRE WOUND RESISTOR 220 OHM
4	407037A	SOCKET & PIN HEADER
5	380200	CAPACITOR 1200 MFD 50V
6	402004A	DUAL PRIMARY TRANSFORMER
7	310095	BRIDGE RECTIFIER
8	350040	HEATSINK
9	405006B	FUSE CLIP
	405021A	1/2 AMP. FAST BLOW FUSE
10	407017	MOLEX PLUG

ILLUSTRATION 2-4

COVER ASSEMBLY



COVER ASSEMBLY PARTS LIST

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	601285A	PAINTED COVER
2	601262A	BROWN INDICATOR KNOB W/FELT
3	100805A	INSTRUMENT PANEL OVERLAY
4	100815A	INSTRUMENT PANEL UNDERLAY
5	601310B	PRINTED CIRCUIT BOARD ASSEMBLY
6	404001	TREATMENT TIMER
7	601311A	BUZZER & BOARD ASSEMBLY

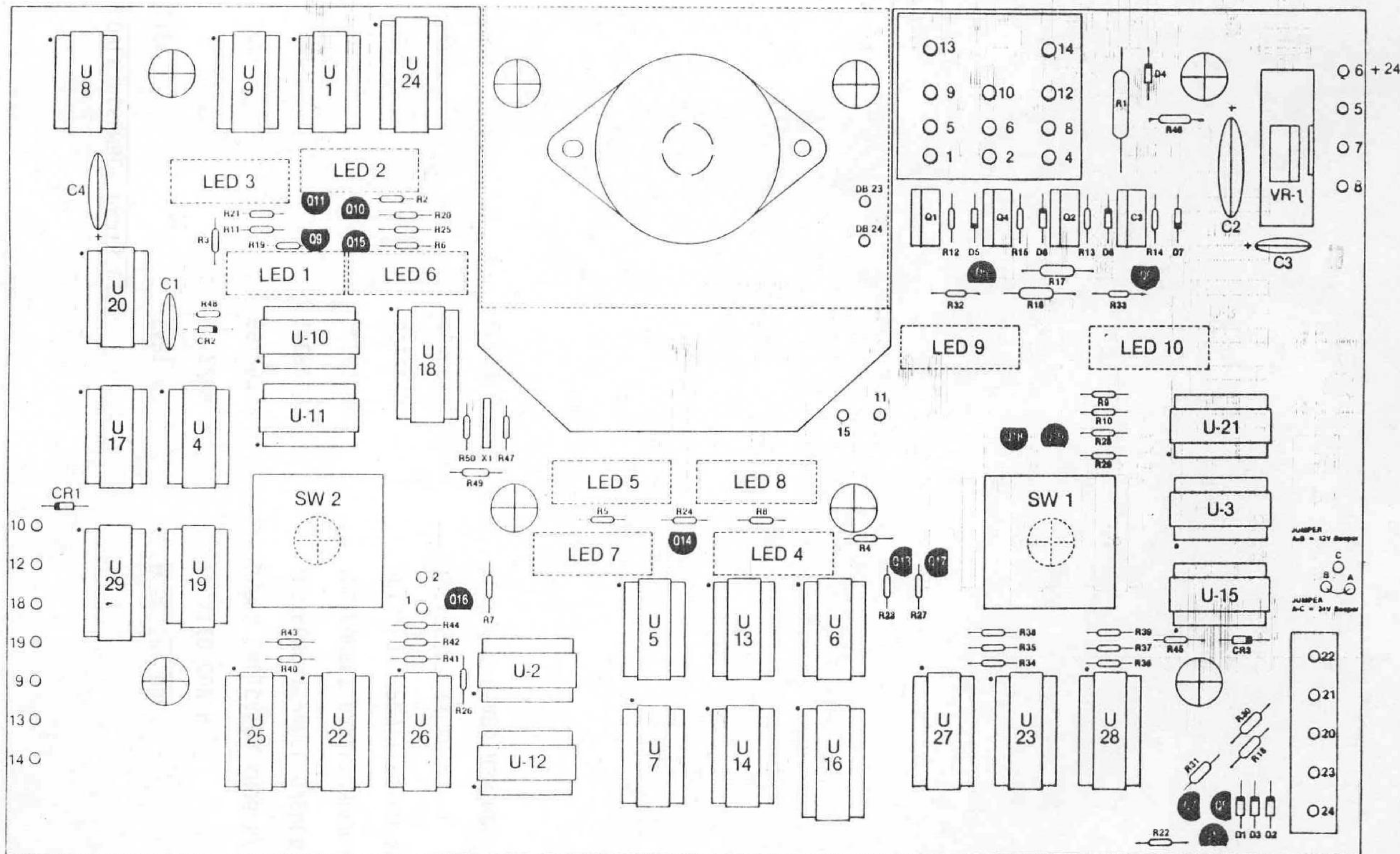


ILLUSTRATION 2-5
PC BOARD COMPONENT LAYOUT

PC BOARD PARTS LIST

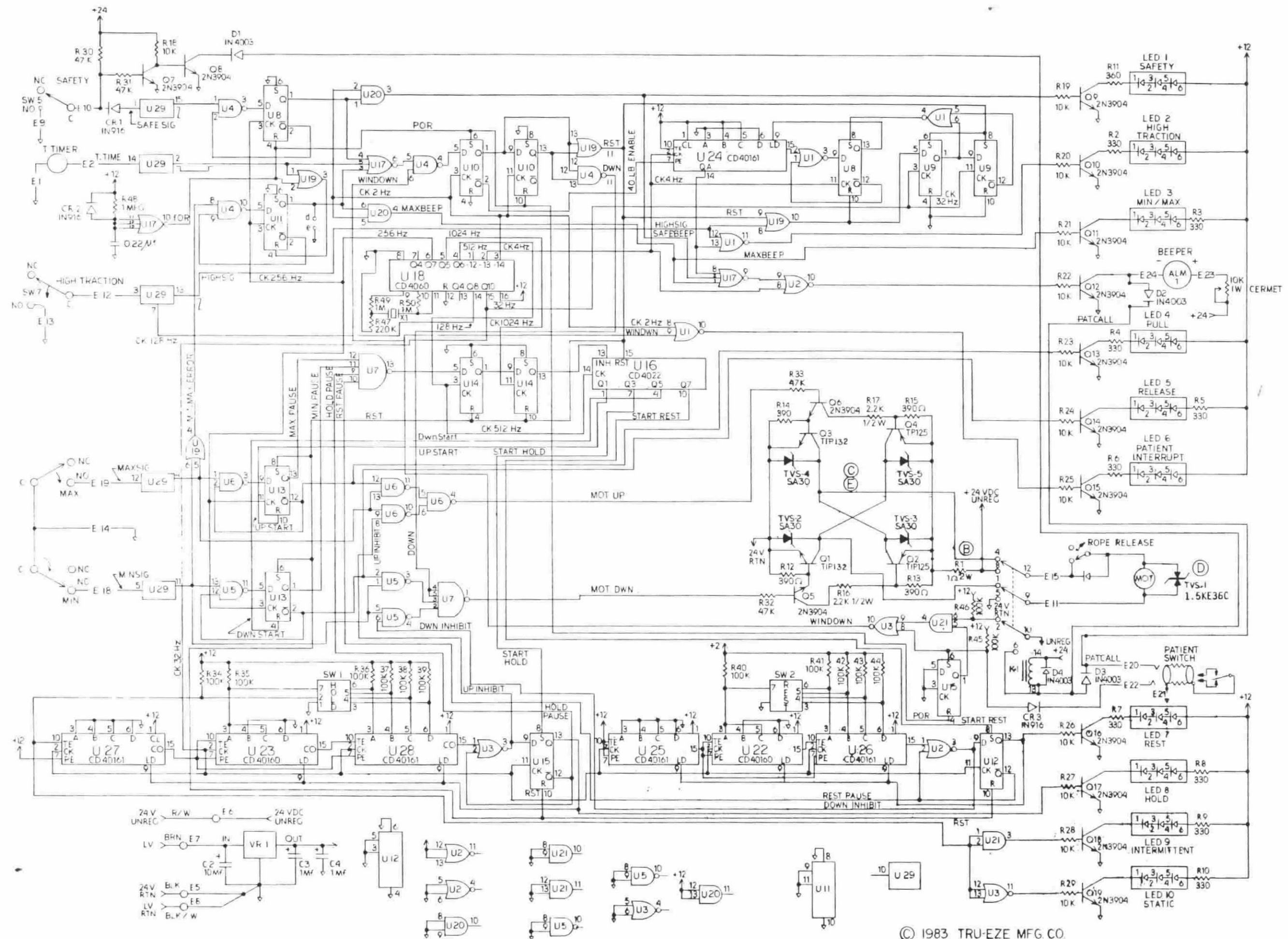
ITEM	DESIGNATION	QTY	DESCRIPTION	TRU-TRAC PART NUMBER	MANUFACTURER
1	R1	1	RESISTOR, 1 OHM, 2 WATT, 20%	300103A	ANY
2	R2 THRU R10	9	RESISTOR, 330 OHM, 1/4 WATT, 20%	303311B	ANY
3	R11	1	RESISTOR, 360 OHM, 1/4 WATT, 20%	303611A	ANY
4	R12,13,14,15	4	RESISTOR, 390 OHM, 1/4 WATT, 20%	303911B	ANY
5	R16,17	2	RESISTOR, 2.2 K OHM, 1/2 WATT, 20%	302222B	ANY
6	R18 THRU R29	12	RESISTOR, 10 K OHM, 1/4 WATT, 20%	301031B	ANY
7	R30,31,32,33	4	RESISTOR, 47 K OHM, 1/4 WATT, 20%	304731B	ANY
8	R34 THRU R46	13	RESISTOR, 100 K OHM, 1/4 WATT, 20%	301041B	ANY
9	R47	1	RESISTOR, 220 K OHM, 1/4 WATT, 20%	302241A	ANY
10	R48,49,50	3	RESISTOR, 1 MEG OHM, 1/4 WATT, 20%	301051B	ANY
11	C1	1	CAPACITOR, .22 MICROFARAD, 25V, 20%, MONOLITHIC	380400A	ANY
12	C2	1	CAPACITOR, 10 MICROFARAD, 50V, -50+100%, TANTALUM	380410A	ANY
13	C3,4	2	CAPACITOR, 1 MICROFARAD, 25V, -50+100%, TANTALUM	380420A	ANY
14	U1,2,3	3	IC, CD4001BE, QUAD 2-INPUT NOR GATE	340120A	ANY
15	U4,5,6	3	IC, CD4011BE, QUAD 2-INPUT NAND GATE	340030A	ANY
16	U7	1	IC, CD4012BE, DUAL 4-INPUT NAND GATE	340130A	ANY

PC BOARD PARTS LIST

ITEM	DESIGNATION	QTY	DESCRIPTION	TRU-TRAC PART NUMBER	MANUFACTURER
17	U8 THRU U15	8	IC, CD4013BE, DUAL D-TYPE FLIP FLOP	340050A	ANY
18	U16	1	IC, CD4022BE, DECODED BINARY COUNTER	340140A	ANY
19	U17	1	IC, CD4025BE, TRIPLE 3-INPUT NOR GATE	340150A	ANY
20	U18	1	IC, CD4060BE, OSCILLATOR/14 STAGE BINARY COUNTER	340160A	ANY
21	U19	1	IC, CD4071BE, QUAD 2-INPUT OR GATE	340170A	ANY
22	U20,21	2	IC, CD4081BE, QUAD 2-INPUT AND GATE	340180A	ANY
23	U22,23	2	IC, CD40160BE, 4-BIT DECADE COUNTER	340190A	ANY
24	U24 THRU U28	5	IC, CD40161BE, 4-BIT BINARY COUNTER	340200A	ANY
25	U29	1	IC, MC14490FP, HEX CONTACT DEBOUNCER	340210A	MOTOROLA
26	Q1,Q3	2	TRANSISTOR, TIP 120 DARLINGTON PAIR	320090A	MOTOROLA
27	Q2,Q4	2	TRANSISTOR, TIP 125 DARLINGTON PAIR	320100A	MOTOROLA
28	Q5 THRU Q19	15	TRANSISTOR, 2N3904, NPN SWITCH, SMALL SIGNAL	320110A	ANY (MOTOROLA)
29	CR1,2,3	3	DIODE, 1N916, SILICON, SMALL SIGNAL	310120A	ANY
30	D1 THRU D8	8	DIODE, 1N4003, SILICON, RECTIFIER	310130A	ANY
31	VR1	1	IC, 7812, +12 VOLT REGULATOR	340080A	ANY
32	X1	1	CRYSTAL, CK-1H32768C, SERIES OSCILLATOR	340220A	STATEK

ILLUSTRATION 2-6

NO. 990004B (5/85)



SCHEMATIC TT-92B

DETAILED CIRCUIT DESCRIPTION FOR TT-92B UNIT

The power supply for the TT-92B contains an isolation transformer with multi-tap primary and secondary windings. The primary winding taps are connected to the voltage selector in the main AC connector. This design makes it possible to provide correct connections for all line voltages from 100-240 volts AC.

The 24 volt secondary winding of transformer T-1 is connected to a bridge rectifier and filter network and provides 24VDC to regulator VR1 on the control circuit board. 24VDC unregulated, available at contact E-6, is directly connected to the DC motor through relay K-1. Regulator VR-1 provides regulated 12VDC to the motor control circuitry.

When power is applied and the patient timer is turned on, a low is applied to U-17, pin 5, which through IC's U-4, U-10 and U-19 causes "RST" to go high. This high reset is applied to the counters and timers to "initialize" them.

Counter U-16 starts with a high on Pin 1. This high signal is called "UPSTART" and is applied to U-13, pin 10, which causes U-6, pin 4, to be high. This high, called "MOT UP" is applied to Q-6 of the darlington transistor network consisting of Q-1, Q-2, Q-3, Q-4, Q-5 and Q-6. 24VDC is applied to the motor in the correct polarity to make it pull up. At the same time a high is applied to the base of Q-13 causing the "PULL" LED4 to illuminate.

When the poundage set is reached, the maximum poundage switch SW3 closes causing a low at U-6, pin 1, which makes the signal "MAX PAUSE" at U-7, pin 12, high and causing U-7, pin 13, to be high. This high, through the flip-flops in U-14, increments the count on U-16 and causes the signal "START HOLD" at U-16, pin 7, to go high. This high then starts the hold timer, consisting of SW1, U-3, U-23, U-27, U-28 and resistors R34, R35, R36, R37, R38 and R39. It is also applied to the base of Q-17, causing the "HOLD" LED5 to illuminate.

When the time, selected by SW1 expires, U-28, pin 15, goes high causing U-3, pin 3, to go low which makes U-15, pin 12, high. This high is called "HOLD PAUSE" and it is applied to U-7, pin 9, causing U-7, pin 13, to go high and incrementing the counter U-16. When the counter U-16 increments, pin 4 goes high. This high is called "DWN START" and is applied to U-13, pin 4, causing U-7, pin 1 to be high. This high is called "MOT DWN" and is applied to Q-5 of the darlington network, causing the polarity on the motor to be reversed and letting it wind down. At the same time, a high is applied to the base of Q-14, causing the "RELEASE" LED5 to illuminate.

At the poundage set by the minimum poundage cam, the minimum poundage or reset switch SW4 closes, causing U-5, pin 13, to go low. This then drives U-13, pin 5, high, making U-13, pin 1, high. This high is called "MINIMUM PAUSE" and is applied to U-7, pin 11, causing U-7, pin 13, to go high and incrementing the counter U-16. When the counter U-16 increments, pin 10 goes high. This high is called "START REST" and starts the rest timer, consisting of SW2, U-2, U-22, U-25, U-26 and resistors R40, R41, R42, R43 and R44. It is also applied to the base of Q-16, causing the "REST" LED7 to illuminate. When the time, selected by SW2 expires, U-26, pin 15, goes high, causing U-2, pin 3, to go low, which makes U-12, pin 12, high. This high is called "REST PAUSE" and is applied to U-7, pin 10, causing U-7, pin 13, to go high and incrementing the counter U-16. When the counter U-16 increments, pin 1 goes high and the process starts again.

If the minimum and maximum poundage cams are set to within 10 pounds of each other, a "min/max error" signal will be generated at U-19, pin 4. If the poundage cam is turned down to a setting of 10 or more pounds below the pulled poundage, the safety switch SW-5 is closed, causing a "SAFE SIG" signal to be generated at U-4, pin 1. If the time on the treatment timer expires, a high signal is applied to U-17, pin 5.

The signals, "min/max error" from U-19, "SAFE SIG" from U-4 or the treatment timer expiring will cause U-4, pin 11, to go high. This signal, called "DWN" is then applied to U-7, pin 4 and 5, and causes the motor to wind down. The signals "min/max error" and "SAFE SIG" are also applied to the bases of Q-11 and Q-9 respectively. The high on each base will illuminate the corresponding LED, Q-11 being "min/max error" LED3, and Q-9 being "SAFETY" LED1. If the poundage cam is set to 40 pounds, or higher, the high traction switch SW7 is closed, which causes a "HIGH TRACTION" signal. This signal is applied to the base of Q-10, causing the "HIGH TRACTION" LED2 to illuminate. It is also applied to the base of Q-12, causing the audible alarm to sound. The LED will continue to be illuminated as long as SW7 is closed, but the audible alarm will be cancelled by the timer consisting of U-1, U-8, U-9 and U-24.

If the patient switch is activated at any time during the treatment cycle, relay K-1 is energized and polarity to the motor is such that the motor will wind down. At the same time, the audible alarm is sounded and the "PATIENT INTERRUPT" LED6 is illuminated. The audible alarm will sound for 3 seconds, and LED6 will remain illuminated until the power is turned off.

When the motor winds down to the 0 pounds or rest position, switch SW6 will open and stop the motor, preventing the motor from winding the rope backward on the rope drum.

When SW1 is set to the "intermittent" positions, the traction will occur in the sequence described, and a high will be applied to the base of Q-18, illuminating the "INTERMITTENT" LED9.

When SW1 is placed in the "static" position, the motor will pull to the set poundage, and will hold there until SW1 is moved out of the "static" position, or one of the following occurs: the patient treatment timer expires, the on/off switch is turned off, or the patient control switch is activated. When SW1 is in the "static" position, a high will be applied to the base of Q-19, illuminating the "STATIC" LED10.

SECTION III

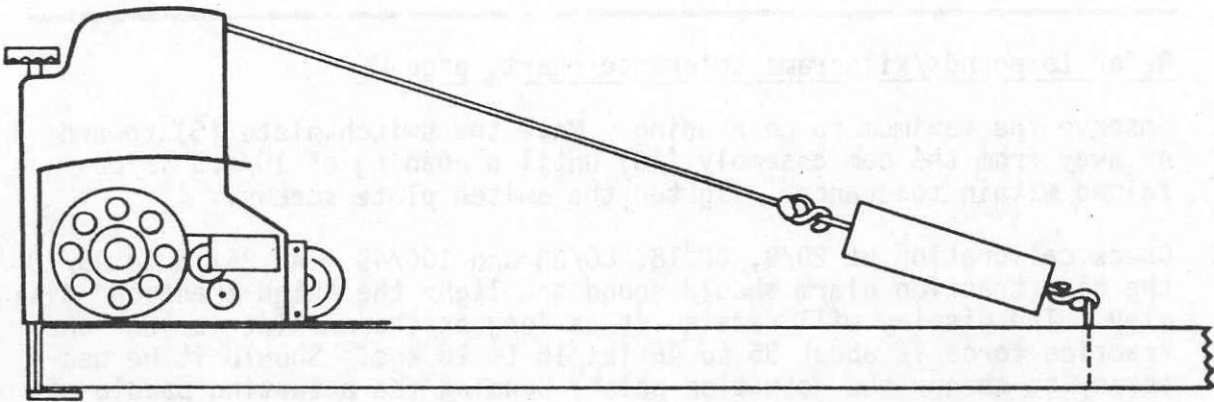
PREPARING UNIT FOR CALIBRATION

1. Disconnect power from the traction machine.
2. Remove the cover (Illustration 1-1, Section I) and the cover plate (Illustration 1-2, Section I).
3. Secure machine to a suitable surface as shown below:

A sliding type scale with known accuracy is best for checking and setting calibration.

CAUTION: Be aware of all input voltage wiring, terminals and connections when unit is energized.

Note: To operate the machine with the cover removed, use jumper wires to connect the molex plugs to each respective half. Keep the wires clear of all moving parts!



CALIBRATION PROCEDURES

(Refer to Illustration 3-1, Page 42)

Note: Scale readings are expressed as "10/4-5" (for example), the first figure POUNDS, the second figure KILOGRAMS.

1. Turn the tension release cam (1) away from the tension release switch (2). Snug the reset switch plate screws (3) and (4). Turn the force spring adjustment screw (6) clockwise until the switcharm moves back far enough for the tension release switch (2) to contact, but not be activated by, the tension release cam (1).
2. Snug the traction switch plate (5) approximately in the middle of its range of adjustment.
3. Set the variable minimum reset at its lowest setting. Check that the reset arm (8) moves freely and spring (11) is located in groove of spring guide (12). Check that spring (11) does not interfere with the minimum reset cam (9). Set the traction force to 10/4.5.
4. Connect power to the cover, set the Rest/Hold timers at 2.5 seconds each, the power "On" and the treatment timer "On".
5. Set the machine cycle a few times and observe the minimum reset and maximum traction points. Move the reset switch plate (7) towards or away from the reset arm (8) until a reading of 4/1.8 is obtained (Be sure the minimum reset arm (8) is set on its lowest setting). Tighten the switch plate screws (3) and (4) and adjust the indicator knob for the variable minimum reset reading if necessary.

Refer to pounds/kilograms tolerance chart, page 43

6. Observe the maximum force reading. Move the switch plate (5) toward or away from the cam assembly (10) until a reading of 10/4.5 is obtained within tolerance. Tighten the switch plate screws.
7. Check calibration at 20/9, 40/18, 80/36 and 100/45. At 35/15 to 45/20 the high traction alarm should sound and light the "high traction" display. The display will remain lit as long as the machine is "On" and traction force is about 35 to 45 lbs/16 to 20 kgs. Should it be necessary to change the actuation point, bending the actuating paddle of switch (13) is the only adjustment possible.
8. Check the traction force at 10/4.5. If the difference is less than 2/9 use the traction force spring adjustment screw (6) to correct the reading. If the difference is more than 2.9, return the max traction setting to 20/9 and adjust switch plate (5). Re-check reading at 10/4.5. (Always make switch plate adjustments at 20/9 setting.)
9. Re-check the minimum reset point from a high max. traction setting (100/45). Reset switch (14) must actuate at 4/1.8. Adjust switch plate (7) if necessary. (Be sure minimum reset arm (8) is set at lowest reset position.)

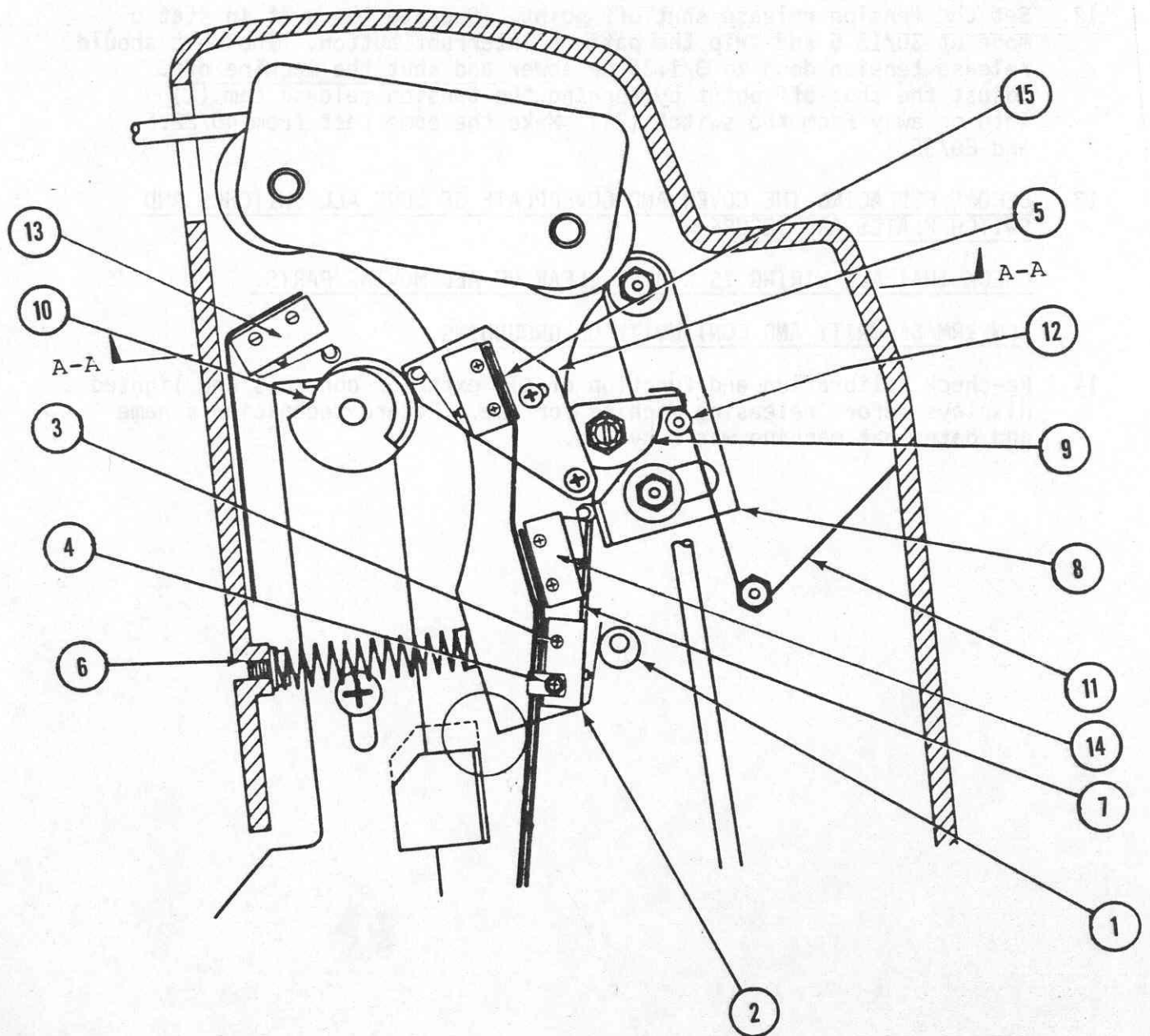
10. Check function of safety switch (mounted under traction force switch (15). Set traction force at 50/22.5 and run unit in the "Static" traction mode to this setting. Slowly turn the traction force cam (10) to a lower setting and observe the trip point. At 10/4.5 to 15/6.75 below the original traction setting the safety should actuate and gradually release all tension on the traction cord.
11. Check variable minimum reset for function at various settings with the unit running in the intermittent mode and the max traction set at 60/27 or higher. Adjust minimum reset knob if necessary.
12. Set the tension release shut off point. Operate the unit in static mode at 30/13.5 and trip the patient interrupt button. The unit should release tension down to 3/1.35 or lower and shut the machine off. Adjust the shut-off point by turning the tension release cam (1) into or away from the switch (2). Make the same test from 40/22.5 and 80/36.
13. BEFORE REPLACING THE COVER AND COVERPLATE BE SURE ALL SWITCHES AND SWITCH PLATES ARE SECURE.

CHECK THAT ALL WIRING IS ROUTED CLEAR OF ALL MOVING PARTS.

CONFIRM SECURITY AND CONTINUITY OF GROUNDING.

14. Re-check calibration and function of all exterior controls and lighted displays before releasing machine for use. Record technician's name and date that machine was serviced.

ILLUSTRATION 3-1



TOLERANCE CHART

TRU-TRAC MODEL NO. TT-92B

<u>POUNDS INDICATED</u>		<u>ACTUAL POUNDAGE</u>	<u>ACCEPTABLE RANGE</u>
10.....	10	+	1 LB.
20.....	19	-	21
30.....	28.5	-	31.5
40.....	38	-	42
50.....	47.5	-	52.5
60.....	57	-	63
70.....	66.5	-	73.5
80.....	76	-	84
90.....	85.5	-	94.5
100.....	95	-	105

($\pm 5\%$)

<u>KILOGRAMS INDICATED</u>	<u>ACTUAL KILOGRAM</u>	<u>ACCEPTABLE RANGE</u>	<u>(POUNDS EQUIVALENT)</u>
5.....	5		11 + 1 LB.
10.....	9.5	- 10.5	20.9 - 23.1
15.....	14.25	- 15.75	28.8 - 34.7
20.....	19	- 21	41.8 - 46.3
25.....	23.75	- 26.25	52.3 - 57.8
30.....	28.5	- 31.5	62.8 - 69.3
35.....	33.25	- 36.75	73.2 - 81
40.....	38	- 42	83.7 - 92.5
45.....	42.75	- 47.25	94.1 - 104

($\pm 5\%$)

BILL OF MATERIAL

TT-92B12

----- ITEM NUMBER -----	DESCRIPTION	UM	QTY PER
601261A	TRU-TRAC TT92B12	EA	1.000
.100420	SHAFT. RESET CAM EXTENSION	EA	1.000
.100803B	DIAL.FORCE LB/KG RT SIDE 92B	EA	1.000
.201023B	SCREW. PHILIPS MACH. PAN HEAD	EA	6.000
.201068	SCREW MACHINE BD.HD.SLT.	EA	1.000
.203002	WASHER. FLAT NYLON. 1/4"ID	EA	1.000
.509036	COLLAR. SET (ZINC)	EA	1.000
.601262A	KNOB ASSY.BRN INDICATOR W/FELT	EA	2.000
..203066A	WASHER. FELT W/PS ADHESIVE	EA	2.000
..502030A	KNOB BROWN INDICATOR	EA	2.000
.601271A	CASTING ASSY.B12 OR B24	EA	1.000
..100015	BLOCK.CLAMPING SHAFT *D*	EA	1.000
...022003	ALUMINUM. BAR. SQUARE	FT	.146
..100020	SHAFT.SWITCHARM PIVOT-ALL TT'S	EA	1.000
..100022I	ARM. ROPE RELEASE	EA	1.000
...013060	STEEL.FLAT 16 GA X 6-7/8 -101B	FT	.250
...080022	NICKEL PLATE/ARM.ROPE RELEASE	EA	1.000
..100024	BUTTON SPRING ADJUSTMENT	EA	1.000
...011035	STEEL. ROUND 5/8" AISI 12L14	FT	.029
...080024	NICKEL PLATE/BUTTON SPRING ADJ	EA	1.000
...080024A	BUTTON.FORCE ADJ.MACHINED	EA	1.000
..100025	DRUM.ROPE (MACHINED) *A*	EA	1.000
...100026	DRUM.ROPE (MOLDING) *A*	EA	1.000
..100131	ROPE ONLY.48"SOLID BRAID NYLON	EA	1.000
...408001	ROPE #7 SOLID BRAID NYLON	FT	4.000
..100176	SPRING.FORCE REGULATOR *A*	EA	1.000
..100356	PAN. FORMED BOTTOM	EA	1.000
...014002	STEEL. SHEET 14 GA CR	EA	1.001
...080356	NICKEL PLATE/BOTTOM PAN	EA	1.000
...201187A	STUD.THREADED PRESS 8-32 X 1/2	EA	5.000
...202034	INSERT. THREADED	EA	6.000
..100366	CAM. MINIMUM RESET	EA	1.000
...014008	STEEL.SHEET 16 GA. (.0598")	SF	.007
...080366	NICKEL PLATE/CAM. MIN. RESET	EA	1.000
..100367	ARM RESET	EA	1.000
...013071	STEEL.FLAT 16 GA.X3-5/16 -101B	FT	.230
...080367	NICKEL PLATE/ARM RESET	EA	1.000
...201119	STUD. PRESS. THREADED	EA	1.000
..100368	SHAFT.RESET CAM 1/4-28 THRD.	EA	1.000
...080368	NICKEL PLATE/SHAFT. RESET CAM	EA	1.000

BILL OF MATERIAL

TT-92B12

----- ITEM NUMBER -----	DESCRIPTION	UM	QTY PER
..100372C	SPACER,DC GEAR BACKLASH ADJ.	EA	1.000
..100389	BRACKET, IDLER ADJUST: *A*	EA	1.000
...013052	STEEL,FLAT 16 GA X 1/2- 1018	FT	.120
...080389	NICKEL PLATE/BRACKET IDLER ADJ	EA	1.000
..100393B	SPACER,CASTING #10 X 1.4"	EA	1.000
..100394B	SPRING, RESET ARM	EA	1.000
..100395	BUSHING,SPRING GUIDE *C*	EA	1.000
...207016	SPACER,BRASS 1/4 X 1/4 X 6-32	EA	1.000
..100453	SPRING, REWIND *B*	EA	1.000
..100461	CUP, REWIND SPRING (MACH.)	EA	1.000
...080461	NICKEL PLATE/REWIND SPRING CUP	EA	1.000
...509045	CUP REWIND SPRING (RAW)	EA	1.000
..100804B	DIAL,FORCE LB/KG LT SIDE 92B	EA	1.000
..201009	SCREW, MACH PANHD PHILL	EA	1.000
..201013	SCREW, MACH, FL, HD, PHIL.	EA	4.000
..201016B	SCREW, SOCKET HEAD CAP	EA	2.000
..201017	SCREW, MACH, FL, HD, PHIL	EA	2.000
..201020	SCREW, MACH, FL, HD, PHIL.	EA	1.000
..201025	SCREW, 4-40 THREAD X 7/16"LONG	EA	1.000
..201029B	SCREW, MACHINE, PAN HD, #6-32	EA	1.000
..201068	SCREW MACHINE BD,HD,SLT.	EA	1.000
..201072	SCREW MACH, PAN PHIL.	EA	1.000
..201085	SCREW PAN HEAD PHILLIPS MACH.	EA	1.000
..201127	SCREW, MACH, RD SLOT	EA	1.000
..201129	SCREW, MACH, FL, PHIL	EA	2.000
..201131	SCREW, MACH, FL, SLOT	EA	2.000
..201145	SCREW, MACH, RD, HEAD	EA	1.000
..201155	SCREW, MACH,HEX HD 10-32 X 1/2	EA	1.000
..202002	NUT,HEX HEAD CAP (ACORN)	EA	2.000
..202003	NUT, HEX #10-32, ZINC PLATED	EA	1.000
..202004	NUT, HEX 6-32	EA	5.000
..202005	NUT, HEX #4-40 THD	EA	1.000
..202017	NUT, HEX, SELF-LOCKING #6-32	EA	1.000
..202018	NUT, HEX ESNA 8-32	EA	1.000
..202040	NUT, HEX	EA	5.000
..202044	NUT, HEX, ESNA	EA	1.000
..202047	NUT, HEX	EA	2.000
..202055	NUT, HEX LOCK	EA	1.000
..203005	WASHER, EXTERNAL TOOTH LOCK #8	EA	4.000
..203006	WASHER, LOCK, INT, TOOTH	EA	3.000
..203008	WASHER, FLAT NYLON, 1/4 ID	EA	4.000
..203025	WASHER, ROPE RELEASE SHOULDER	EA	2.000
..203040	WASHER, RESET ARM SHOULDER	EA	2.000
..203043	WASHER, LOCK, EXT, TOOTH	EA	1.000
..203060	WASHER, FLT AL	EA	2.000
..203062	RETAINER WASHER, REWIND SPRING	EA	1.000
..206033	NYLON 'P' CLIP	EA	1.000

BILL OF MATERIAL

TT-92B12

ITEM NUMBER	DESCRIPTION	UM	QTY PER
.206040A	BUMPER, TT ROPE	EA	1.000
.207016	SPACER, BRASS 1/4 X 1/4 X 6-32	EA	3.000
.207029A	CLAMP, NYLON CABLE	EA	1.000
.403016	INSULATOR	EA	4.000
.409008	CABLE TIE, FLAT, 3" LONG	EA	5.000
.409025	MOUNT, CABLE TIE	EA	1.000
.501002	BEARING BRONZE, FLANGED	EA	1.000
.502031A	KNOB BROWN CLAMPING	EA	1.000
.503001	SPRING COMPRESSION	EA	1.000
.503002	SPRING EXTENSION	EA	1.000
.509003	COLLAR, SET (ZINC)	EA	1.000
.600390	CONNECTOR TRU-TRAC ACCESSORY	EA	1.000
...013026	STEEL, FLAT 1/8X 2-1/4 SAE 1018	FT	.180
...080242	NICKEL PLATE- BARREL	EA	2.000
...203017B	WASHER, FLAT NYLON	EA	1.000
...204014	EYELET, BRASS	EA	1.000
.600420	BRACKET, CLAMPING (& SHAFT)	EA	1.000
...100012	SHAFT, CLAMPING *B*	EA	1.000
...080012	NICKEL PLT-CLAMPING SHAFT	EA	1.000
...610510B	CLAMPING BRACKET-NICKEL PLATED	EA	1.000
...081510B	NICKLE PLATE-CLAMPING BRACKET	EA	1.000
...100765B	BRACKET CLAMP, BLANKED & FORMED	EA	1.000
...013077A	STEEL STRIP HR 3/16 X 3.5 X 12	FT	.500
...100766	BLOCK, CLAMPING BRACKET	EA	1.000
.600440B	CAM, RESET ASSEMBLY (1/2" DIA)	EA	1.000
...100027B	CAM, ONLY-RESET, TEN, REL, TTT-92	EA	1.000
...021008	ALUMINUM, BAR, ROUND	FT	.042
...201011	SCREW, SOCKET SET 1/4-20 X 1"	EA	1.000
.600512	IDLER GEAR ARM ASSEMBLY	EA	1.000
...100373	GEAR, TT92 IDLER (MACHINED)	EA	1.000
...500003	GEAR, MOTOR 20/14.5/20	EA	1.000
...501023	BEARING BRONZE 1/4IDX3/BL	EA	1.000
...100374	ARM, IDLER GEAR	EA	1.000
...013049	STEEL, FLAT 16 GA X 1-1/8- 1018	FT	.460
...080374	NICKEL PLATE/IDLER GEAR ARM	EA	1.000
...201119	STUD, PRESS, THREADED	EA	2.000
...100375	PLATE, GEAR RETAINER (IDLER ARM)	EA	1.000
...013049	STEEL, FLAT 16 GA X 1-1/8- 1018	FT	.100
...080375	NICKEL PLATE/GEAR RETAIN PLATE	EA	1.000
...201015	SCREW, MACH. TR. HD. PHIL.	EA	1.000

BILL OF MATERIAL

TT-92B12

----- ITEM NUMBER -----	DESCRIPTION	UM	QTY PER
...201124	SCREW, MACH. PAN. PHIL	EA	2.000
...202003	NUT, HEX #10-32, ZINC PLATED	EA	1.000
...203002	WASHER, FLAT NYLON, 1/4"ID	EA	3.000
...203003	WASHER, #10 INTERNAL TOOTH LOCK	EA	1.000
...207009	SPACER, ALUM. 3/16X5/16X1/2" L.	EA	1.000
...207013	SPACER, BRASS 1/4 X 1/2 X 6-32	EA	2.000
...203002	WASHER, FLAT NYLON, 1/4"ID	EA	3.000
...203003	WASHER, #10 INTERNAL TOOTH LOCK	EA	1.000
..601211A	POWER SUPPLY TT-92B	EA	1.000
...100819A	BRACKET 402004A TRANSFORMER	EA	2.000
....013075	STEEL, FLAT 16 GA. X 2-3/4- 1018	IN	5.000
....080819A	NICKEL PLATE/BRKT, TRANSFORMER	EA	2.000
...100820B	BOARD, 92B POWER SUPPLY PC	EA	1.000
...201029	SCREW, MACH. PAN PHIL-BK OXIDE	EA	1.000
...201185A	SCREW, HEX HEAD MACHINE	EA	4.000
...202004	NUT, HEX 6-32	EA	1.000
...202018	NUT, HEX ESNA 8-32	EA	4.000
...203043	WASHER, LOCK, EXT. TOOTH	EA	1.000
...203065	WASHER, FLAT STEEL #8	EA	6.000
...207009	SPACER, ALUM. 3/16X5/16X1/2" L.	EA	2.000
...207022	SPACER, NYLON	EA	2.000
...207030A	MP, NYLON CABLE	EA	1.000
...302215	RESISTOR, WIREWOUND	EA	1.000
...303505	RESISTOR, WIREWOUND	EA	1.000
...310095	RECTIFIER, BRIDGE	EA	1.000
...350040	HEATSINK	EA	1.000
...380200	CAPACITOR, ELEC.	EA	2.000
...402004A	TRANSFORMER, DUAL PRIMARY	EA	1.000
...405006B	CLIP, INTERNATIONAL FUSE	EA	2.000
...405021A	FUSE, 1/2 AMP FAST BLOW	EA	1.000
...406001	TERMINAL, RING, 22-16GA	EA	1.000
...407016	PIN, FEMALE AMP #350570-1	EA	6.000
...407017	PLUG, 6-PIN	EA	1.000
...407037A	HEADER, SOCKET 4 PIN	EA	1.000
...408068	TUBING, 3/16" DIA. SHRINK	EA	2.500
...408123	WRAP, HARNESS	EA	.583
...408149A	WIRE, 18GA, STRANDED GRN/YEL	EA	1.000
...409008	CABLE TIE, FLAT, 3" LONG	EA	1.000
...409027	TIE, FLAT CABLE	EA	2.000
...408800A	WIRE, STRANDED 18 GA. 10.5"	EA	3.000
...418801A	WIRE, STRANDED	EA	2.000
...418802A	WIRE STRANDED	EA	1.000
...418803A	WIRE STRANDED	EA	1.000
..601262A	KNDB ASSY, BRN INDICATOR W/FELT	EA	2.000
...203066A	WASHER, FELT W/PS ADHESIVE	EA	2.000
...502030A	KNDB BROWN INDICATOR	EA	2.000

BILL OF MATERIAL

TT-92B12

ITEM NUMBER	DESCRIPTION	UM	QTY PER
..601320	ARM SWITCH ASSY,COMP.B/LV/DLV.	EA	1.000
...100364	PLATE, RESET SWITCH	EA	1.000
....013048	STEEL,FLAT 16 GA X 3/8 - 1018	FT	.160
....080364	NICKEL PLATE/SWITCH ARM PLATE	EA	1.000
...201124	SCREW, MACH. PAN. PHIL	EA	2.000
...201133	SCREW, MACH.FD.SLT.2-56 X 5/16	EA	2.000
...201134	SCREW, MACH.RD.SLT. 2-56 X 5/8	EA	2.000
...203009	WASHER, FLAT FIBER	EA	1.000
...206033	NYLON 'P' CLIP	EA	1.000
...403016	INSULATOR	EA	2.000
...408123	WRAP,HARNESS	EA	.833
...601380	SWITCHARM ASSY ONLY B/LV/DLV	EA	1.000
....100179	SWITCHARM,MACHINED LV,DLV, B	EA	1.000
....100180	SWITCH ARM CAST.	EA	1.000
....204017	RIVET, TRUSS HD, SEMI-TUBE	EA	1.000
....206057A	SHAFT RETAINER, TRU-ARC 5/16;	EA	2.000
....501014	BEARING BRONZE	EA	1.000
....509010	PULLEY,BL BRNF,ROPE 1.25"GRV.D	EA	2.000
...601390	HARNESS/SWITCH ASSY, B/LV/DLV	EA	1.000
....100365	PLATE, POUNDAGE SWITCH	EA	1.000
....013050	STEEL,FLAT 16 GA X 2-1/4- 1018	FT	.100
....080365	NICKEL PLATE/POUND SWITCH PLT	EA	1.000
....201134	SCREW, MACH.RD.SLT. 2-56 X 5/8	EA	2.000
....310110	DIODE, POWER	EA	1.000
....403002	SWITCH, SNAP ACTION TEN,REL.	EA	1.000
....403011	SWITCH, SNAP ACTION	EA	3.000
....403010	SWITCH, SNAP ACTION	EA	1.000
....403016	INSULATOR	EA	2.000
....407016	PIN, FEMALE AMP #350570-1	EA	10.000
....407022	PLUG, 12-PIN	EA	1.000
....407025	STRIP,TERMINAL	EA	1.000
....408069	WIRE, 20GA, STRAND (WHITE)	EA	1.000
....408592	WIRE, STRANDED 3" 22GA, WHT/RD	EA	1.000
....408069	WIRE, 20GA, STRAND (WHITE)	EA	1.000
....408622	WIRE, STRANDED 22 GA, 9" RED	EA	1.000
....408666	WIRE, STRANDED 20 GA BLU 5.5"	EA	1.000
....408622	WIRE, STRANDED 22 GA, 9" RED	EA	1.000
....408667A	WIRE, STRND 20 GA BLU 10.25"	EA	1.000
....408666	WIRE, STRANDED 20 GA BLU 5.5"	EA	1.000
....408668A	WIRE, STRANDED 20 GA BLU 10.50	EA	1.000
....408667A	WIRE, STRND 20 GA BLU 10.25"	EA	1.000
....408669A	WIRE, STRANDED 20GA BLU 11.75"	EA	1.000
....408668A	WIRE, STRANDED 20 GA BLU 10.50	EA	1.000
....408684A	WIRE, STRANDED 20 GA 13.75	EA	1.000
....408669A	WIRE, STRANDED 20GA BLU 11.75"	EA	1.000

BILL OF MATERIAL

TT-92B12

----- ITEM NUMBER -----	DESCRIPTION	UM	QTY PER
....408685A	WIRE. STRANDED 20 GA 14.5"	EA	1.000
....408684A	WIRE. STRANDED 20 GA 13.75	EA	1.000
....408686A	WIRE. STRANDED 20 GA 14.5"	EA	1.000
....408685A	WIRE. STRANDED 20 GA 14.5"	EA	1.000
....408687A	WIRE. STRANDED 20 GA 13.75"	EA	1.000
....408686A	WIRE. STRANDED 20 GA 14.5"	EA	1.000
....408689A	WIRE. STRANDED 20 GA 13.5"	EA	1.000
....408687A	WIRE. STRANDED 20 GA 13.75"	EA	1.000
....408693A	WIRE. STRANDED 20 GA. 14.25"	EA	1.000
....408689A	WIRE. STRANDED 20 GA 13.5"	EA	1.000
....408701A	WIRE. STRND 20 GA WH 12.5"STRP	EA	1.000
....408693A	WIRE. STRANDED 20 GA. 14.25"	EA	1.000
....409008	CABLE TIE.FLAT.3" LONG	EA	4.000
....408701A	WIRE. STRND 20 GA WH 12.5"STRP	EA	1.000
....409008	CABLE TIE.FLAT.3" LONG	EA	4.000
..601330	CAM FORCE ADJUSTMENT ASSY	EA	1.000
...100403	CAM. 40 LBS *A*	EA	1.000
...100404	CAM. ROPE RELEASE *A*	EA	1.000
...100406	CAM. STAR CENTERING	EA	1.000
...100409	SHAFT. FORCE CAM *B*	EA	1.000
....080409	NICKEL PLATE/SHAFT.FORCE CAM	EA	1.000
...100535	CAM.FORCE & SAFETY (MACH.)	EA	1.000
....100402	CAM.FORCE AND SAFETY (RAW)	EA	1.000
...203057	WASHER. FLT. NYLONG	EA	3.000
..601400	EMC MOTOR ASSEMBLY	EA	1.000
...100388	GEAR. MOTOR *A*	EA	.100
....201032	SCREW SOCKET SET	EA	.100
....500013	GEAR.MOTOR 20/14.5/15	EA	.100
....501018	BUSHING MOTOR GEAR	EA	.100
...100447	MOTOR. 24VDC ECM (TAPPED)	EA	1.000
....400008	MOTOR. 24 VDC ECM (NOT TAPPED)	EA	1.000
...203005	WASHER. EXTERNAL TOOTH LOCK #8	EA	1.000
...380290C	TRANSIENT VOLTAGE SUPPRESSOR	EA	1.000
...407025	STRIP.TERMINAL	EA	1.000
..601510	MAIN GEAR ASSY (ALL TT92'S)	EA	1.000
...100386	GEAR.MAIN DRIVE (TT92'S)	EA	1.000
....500012	GEAR.SPUR (TT MAIN DRIVE)	EA	1.000
...100387	SHAFT.MAIN DRIVE LV/DLV/B	EA	1.000
...501002	BEARING BRONZE. FLANGED	EA	1.000
...509001	KEY.WOODRUFF #213	EA	1.000
...509002	KEY.WOODRUFF #7	EA	1.000

BILL OF MATERIAL

TT-92B12

ITEM NUMBER	DESCRIPTION	UM	QTY PER
..601771A	CASTING MAIN 92B PAINTED ONLY	EA	1.000
...081772A	PAINT. ENAMEL SEMI-GLCREAM TEXT	EA	1.000
...601660	CASTING MAIN TT-92'S MACHINED	EA	1.000
....100007	CASTING MAIN (RAW. AS CAST)	EA	1.000
....100108	PLATE. COVER DOOR (TRIMMED)	EA	1.000
.....023012	ALUMINUM. STRIP	FT	.330
....201014	SCREW. SOCKET SET	EA	1.000
....201032	SCREW SOCKET SET	EA	1.000
.601282A	COVER TT92B12 ASSEMBLY	EA	1.000
..100818A	UNDERLAY. POWER PANEL	EA	1.000
...013074	STEEL. FLAT 16 GA. X 7 - 1018	EA	.100
...080818A	NICKEL PLATE/UNDERLAY PANEL	EA	1.000
...201158	STUD. PRESS. THREADED	EA	1.000
..100831A	OVERLAY. COMPLIANCE LABEL	EA	1.000
..201023B	SCREW. PHILIPS MACH. PAN HEAD	EA	4.000
..201029	SCREW. MACH. PAN PHIL-BK OXIDE	EA	2.000
..201033	SCREW MACH. PAN SLT.	EA	2.000
..202004	NUT. HEX 6-32	EA	4.000
..202017	NUT. HEX. SELF-LOCKING #6-32	EA	7.000
..203006	WASHER. LOCK. INT. TOOTH	EA	4.000
..203041	WASHER. #6 FLAT STEEL-ZINC	EA	4.000
..403034A	SWITCH. CIRCUIT BREAKER	EA	1.000
..404001	TIMER. TREATMENT	EA	1.000
..407035A	ADAPTER. RECEPTACLE	EA	1.000
..407036A	CONNECTOR. RFI FILTER AND	EA	1.000
..408123	WRAP. HARNESS	EA	.500
..601262A	KNOB ASSY. BRN INDICATOR W/FELT	EA	3.000
...203066A	WASHER. FELT W/PS ADHESIVE	EA	3.000
...502030A	KNOB BROWN INDICATOR	EA	3.000
..601283A	PANEL ASSY. 92B INSTRUMENT	EA	1.000
...100805C	OVERLAY BLANK 92B INST. PANEL	EA	1.000
...100815A	UNDERLAY. NICKEL PLATED -TT92B	EA	1.000
....013073	STEEL. FLAT 16GA. X5-1/4 - 1018	FT	.670
....080815A	NICKEL PLATE - RACK	EA	1.000
...201158	STUD. PRESS. THREADED	EA	4.000
..601285A	COVER CREAM COATED (ALL 92B)	EA	1.000
...081711A	CREAM TEXTURE COAT (92B COVER)	EA	1.000
...100817A	COVER. TT92B UNPAINTED	EA	1.000
....024003	ALUMINUM. SHEET	SF	4.342
....080817A	O.P. MACH. 92B COVER	EA	1.000

BILL OF MATERIAL

TT-92B12

----- ITEM NUMBER -----	DESCRIPTION	UM	QTY PER
..601310D	PC CONTROL BOARD-ALL 92B'S	EA	1.000
...100807C	PRINTED CIRCUIT BOARD	EA	1.000
...201039	SCREW MACH.PAN PHIL	EA	4.000
...203006	WASHER, LOCK, INT. TOOTH	EA	4.000
...207024	SPACER, HEX TAPPED	EA	2.000
...300103B	RESISTOR, CARBON COMP	EA	1.000
...301031	RESISTOR, CARBON FILM	EA	12.000
...301037A	POTENTIOMETER, CTS TRIMMER	EA	1.000
...301041	RESISTOR, CARBON FILM	EA	13.000
...301051	RESISTOR, CARBON FILM	EA	2.000
...301051B	RESISTOR, CARBON FILM 1 MEG OHM	EA	1.000
...302222	RESISTOR CARBON COMP	EA	2.000
...302241A	RESISTOR	EA	1.000
...303311	RESISTOR, 330 OHM 1/4W 5%	EA	9.000
...303611A	RESISTOR	EA	1.000
...303911	RESISTOR, CARBON FILM	EA	4.000
...304731	RESISTOR, 47K OHM 1/4W 5%	EA	4.000
...310120A	DIODE, SILICON UNITRODE	EA	3.000
...310130A	DIODE, SILICON RECTIFIER	EA	4.000
...310131B	SUPPRESSOR, TRANS VOLT-SA30	EA	4.000
...320090B	TRANSISTOR, TIP 132	EA	2.000
...320100A	TRANSISTOR	EA	2.000
...320110A	TRANSISTOR	EA	15.000
...340030	INTEGRATED CIRCUIT CD 4011BE	EA	3.000
...340050	INTEGRATED CIRCUIT CD 4013BE	EA	8.000
...340080	INTEGRATED CIRCUIT	EA	1.000
...340120A	INTEGRATED CIRCUIT CD4001 BE	EA	3.000
...340130A	CIRCUIT, INTEGRATED DUAL 4INPUT	EA	1.000
...340140A	CIRCUIT, INTEGRATED	EA	1.000
...340150A	CIRCUIT, INTEGRATED	EA	1.000
...340160A	OSCILLATOR	EA	1.000
...340170A	CIRCUIT, INTEGRATED	EA	1.000
...340180A	CIRCUIT INTEGRATED	EA	2.000
...340190A	CIRCUIT INTERGRATED	EA	2.000
...340200A	IC, 4-BIT BINARY COUNTER	EA	5.000
...340210A	DEBOUNCER, HEX CONTACT	EA	1.000
...340220A	OSCILLATOR, CRYSTAL SERIES	EA	1.000
...350030	HEAT SINK, REG.	EA	1.000
...380400A	CAPACITOR, .22MFD, 20%	EA	1.000
...380410A	CAPACITOR, TANTALUM	EA	1.000
...380420A	CAPACITOR, TANTALUM	EA	2.000
...401013A	RELAY, IDEC #RH3V2-U24VDC	EA	1.000
...403033A	SWITCH, ROTARY CODE	EA	2.000
...406001	TERMINAL, RING, 22-16GA	EA	2.000
...407033A	SOCKET HEADER, 5 CIRCUIT PCB	EA	1.000
...407034A	PLUG, AMP 5-CIRCUIT NYLON	EA	1.000
...408123	WRAP, HARNESS	EA	1.000
...408138B	WIRE, 18GA STRANDED WHT/YEL	EA	1.000
...408139B	WIRE, 18GA, STRANDED WHT/RED	EA	1.000
...40900B	CABLE TIE, FLAT, 3" LONG	EA	2.000

BILL OF MATERIAL

TT-92B12

ITEM NUMBER	DESCRIPTION	UM	QTY PER
.409028A	LIGHT BAR MODULE	EA	1.000
.409029A	L.E.D. ORANGE LIGHT BAR MODULE	EA	6.000
.409030A	L.E.D. YELLOW LIGHT BAR MODULE	EA	3.000
.601311A	BUZZER & BOARD ASSY	EA	1.000
.100808C	BOARD, BUZZER	EA	1.000
.405012A	BUZZER, MINI	EA	1.000
.407015B	PIN. AMP MALE #350699-1	EA	2.000
.408145A	WIRE. 18GA. STRANDED (GRN)	EA	1.000
.408146A	WIRE. 18GA. STRANDED (BLUE)	EA	1.000
.601431A	HARNESS POWER SUPPLY TT92B	EA	1.000
.407015B	PIN. AMP MALE #350699-1	EA	4.000
.407038A	PLUG. 4 CIRCUIT	EA	1.000
.408125A	WIRE. 18GA. STRANDED WHT/RED	EA	1.000
.408126A	WIRE. 18GA. STRANDED (WHT/BLK)	EA	1.000
.408127A	WIRE. 18GA. STRANDED (BRN)	EA	1.000
.408128A	WIRE. 18GA. STRANDED (BLK)	EA	1.000
.601441A	HARNESS. PCB TO SWITCH ARM	EA	1.000
.407015B	PIN. AMP MALE #350699-1	EA	9.000
.407021	CAP. 12-PIN	EA	1.000
.408129A	WIRE. 20GA. STRANDED (WHT/GRN)	EA	1.000
.408130A	WIRE. 20GA. STRANDED (WHT)	EA	1.000
.408131A	WIRE. 20GA. STRANDED (WHT/GRAY)	EA	1.000
.408132A	WIRE. 20GA. STRANDED (WHT/BRN)	EA	1.000
.408133A	WIRE. 20GA. STRANDED (WHT/VLT)	EA	1.000
.408134A	WIRE. 20GA. STRANDED (WHT)	EA	1.000
.408135A	WIRE. 20GA. STRANDED (WHT/RED)	EA	1.000
.408136A	WIRE. 18GA. STRANDED (BLUE)	EA	1.000
.408137A	WIRE. 18GA. STRANDED (RED)	EA	1.000
.601351A	SWITCH ASSY. PATIENT INTERRUPT	EA	1.000
.403015B	SWITCH. BUTTON	EA	1.000
.407015B	PIN. AMP MALE #350699-1	EA	3.000
.408003	TUBING. SHRINK 1/8" DIA	IN	1.000
.408124A	CORD. PATIENT INTERRUPT-MOLDED	EA	1.000
.601432A	JUMPER PRIMARY POWER (NEUTRAL)	EA	1.000
.406003	TERMINAL. INS. FEM22-18GA	EA	2.000
.408141A	WIRE. 18GA. STRANDED (BLUE)	EA	1.000
.601433A	JUMPER PRIMARY POWER (PHASE)	EA	1.000
.406003	TERMINAL. INS. FEM22-18GA	EA	2.000
.408140A	WIRE. 18GA. STRANDED (BRN)	EA	1.000
.601434A	JUMPER PRIMARY POWER (GROUND)	EA	1.000
.406001	TERMINAL. RING. 22-16GA	EA	1.000
.406003	TERMINAL. INS. FEM22-18GA	EA	1.000
.408149A	WIRE. 18GA. STRANDED GRN/YEL	EA	1.000

BILL OF MATERIAL

TT-92B12

----- ITEM NUMBER -----	DESCRIPTION	UM	QTY PER
..601531A	HARNESS PRIMARY POWER TT92B12	EA	1.000
...406001	TERMINAL RING .22-16GA	EA	1.000
...406003	TERMINAL INS FEM 22-18GA	EA	2.000
...407015B	PIN. AMP MALE #350699-1	EA	2.000
...407018	CAP. 6-PIN	EA	1.000
...407032A	PINS. GROUNDING	EA	1.000
...408144A	WIRE. 18GA. STRANDED GRN/YLLW	EA	1.000
...408147A	WIRE. 18GA. STRANDED (BRN)	EA	1.000
...408148A	WIRE. 18GA. STRANDED (BLUE)	EA	1.000
867004	TRU-TRAC RX CAUTION LABEL	EA	1.000
867008A	SHIPPED UNDER TENSION NOTICE	EA	1.000
867207B	BOX. FOR ALL TT'S	EA	1.000
867208B	TRU-TRAC FOAM INSERT SET	EA	1.000
867210	TRU-TRAC 121124 EB BRADLEY BAG	EA	2.000
867211A	TRU-TRAC PKGING BAG 23X10X39	EA	1.000
867212B	UNPACKING INSTRUCTIONS	EA	1.000
868340	SURE-LOCK HOSP. GRADE CORDSET	EA	1.000
868420	TRACTION MACHINE ACCESSORY PCK	EA	1.000
.868110B	BAG. TT ACCESSORY	EA	1.000
.HH53	DISKARD DISPOSABLE HEAD HALTER	EA	1.000
.HH57	CERVI-TRAC HEAD HALTER	EA	1.000
..712610	WEBBING 3/4" #8717- BROWN	IN	32.000
..712612	WEBBING 1" #8717 - BROWN	IN	6.000
..712910	BIAS TAPES 1 3/16"- BROWN	IN	54.500
..713108A	THREAD #26303/ SABLE	YD	15.000
..735102	D RINGS 5/8" N & J #563	EA	2.000
..735605	CATCH 1" WEST HAVEN #400	EA	2.000
..735705	SLIDE BUCKLE 1" WEST H. #400	EA	2.000
..735902	NICKEL TIPS 1" N & J #1	EA	2.000
..752800	INSERT. HH-57 BACK FOAM	EA	1.000
...752450	FOAM SHT 1/2" X 56" X 50F	SF	.121
..752802	INSERT. CHIN FOAM	EA	1.000
...752450	FOAM SHT 1/2" X 56" X 50F	SF	.031
..752804	BACK. HH57 BROWN DUCK BLANK	EA	1.000
...711463	DUCK.37" 10.38 OZ.-BROWN	YD	.062
..752806	CHIN. HH57 BROWN DUCK BLANK	EA	1.000
...711463	DUCK.37" 10.38 OZ.-BROWN	YD	.016
..752808	BACK. HH57 BROWN BLANKET BLANK	EA	1.000
...711561	BROWN BLANKET	YD	.062
..752810	CHIN. HH57 BROWN BLANKET BLANK	EA	1.000
...711561	BROWN BLANKET	YD	.016
..777302B	TE-B CERVIPILLO BROCHURE	EA	1.000

BILL OF MATERIAL

TT-92B12

----- ITEM NUMBER -----	DESCRIPTION	UM	QTY PER
.7773068	LABEL, SPECIALTIES & CARE INST	EA	1.000
.777398	MISC. INSTRUCTION SHEET	EA	1.000
.777412	6 X 12 PLASTIC BAG	EA	1.000
.PT110	LINE-TITE CLAMP W/CORD	EA	1.000
.408001	ROPE #7 SOLID BRAID NYLON	FT	4.000
.600390	CONNECTOR TRU-TRAC ACCESSORY	EA	1.000
...013026	STEEL, FLAT 1/8X 2-1/4 SAE 1018	FT	.180
...080242	NICKEL PLATE- BARREL	EA	2.000
...203017B	WASHER, FLAT NYLON	EA	1.000
...204014	EYELET, BRASS	EA	1.000
.868316	LINE TIGHT CLAMP - CRIMPED	EA	1.000
...868315	LINE TIGHT CLAMP - UNCRIMPED	EA	1.000
.SC31S	12" CERVICAL BAR (PREM. PLTD)	EA	1.000
.100038	YOKE, SPREADER BAR *A*	EA	1.000
...013061	STEEL, FLAT 16 GA X 8-1/2 -1018	FT	.250
...080038	BLACK POLYESTER	EA	1.000
.100526	SPREADER BAR, 12 INCH	EA	1.000
...011036	STEEL, ROUND 5/16" X 18-3/16"	EA	1.000
...080526	CHROME, PLATE - BARREL	EA	1.000
.204008	RIVER, TRUSS HD. SEMI-TUBE	EA	2.000
990002C	TT92B INSTRUCTION MANUAL	EA	1.000
997200B	WARRANTY REGISTRATION CARD	EA	1.000

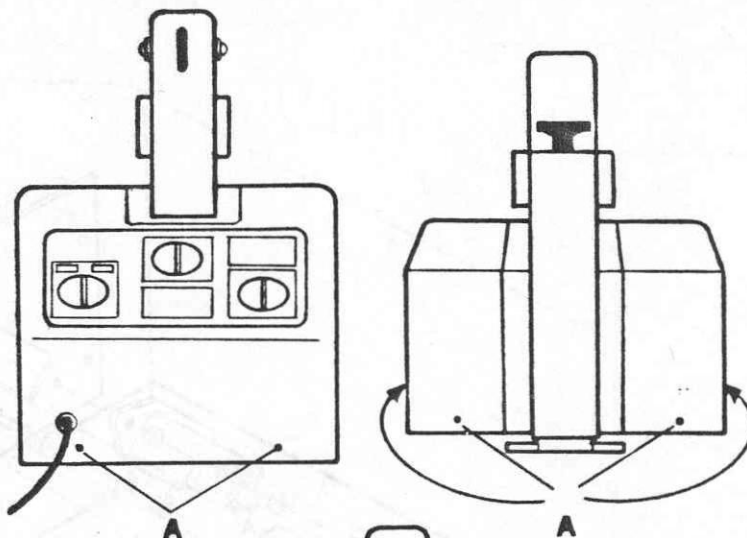
ILLUSTRATION 1-1

REMOVING COVER

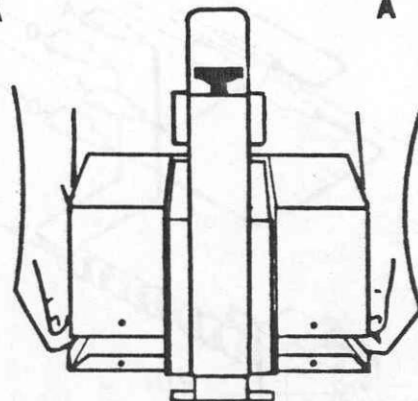
WARNING: DISCONNECT ALL POWER TO THE UNIT BEFORE SERVICING.

Be aware of all input voltage wiring, terminals and connections.
Use caution when operating traction machine with the cover removed.

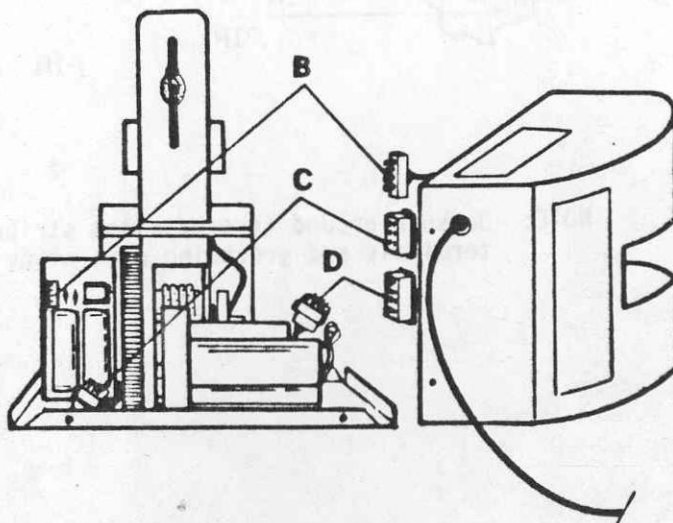
- A. Remove six screws "A".

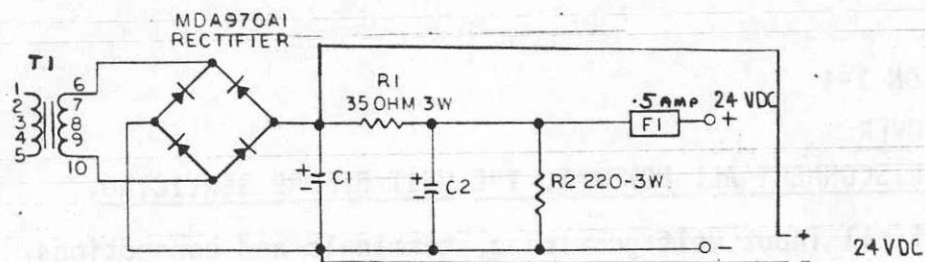


- B. Raise back of cover enough to get a hand under each side of the rear of cover.



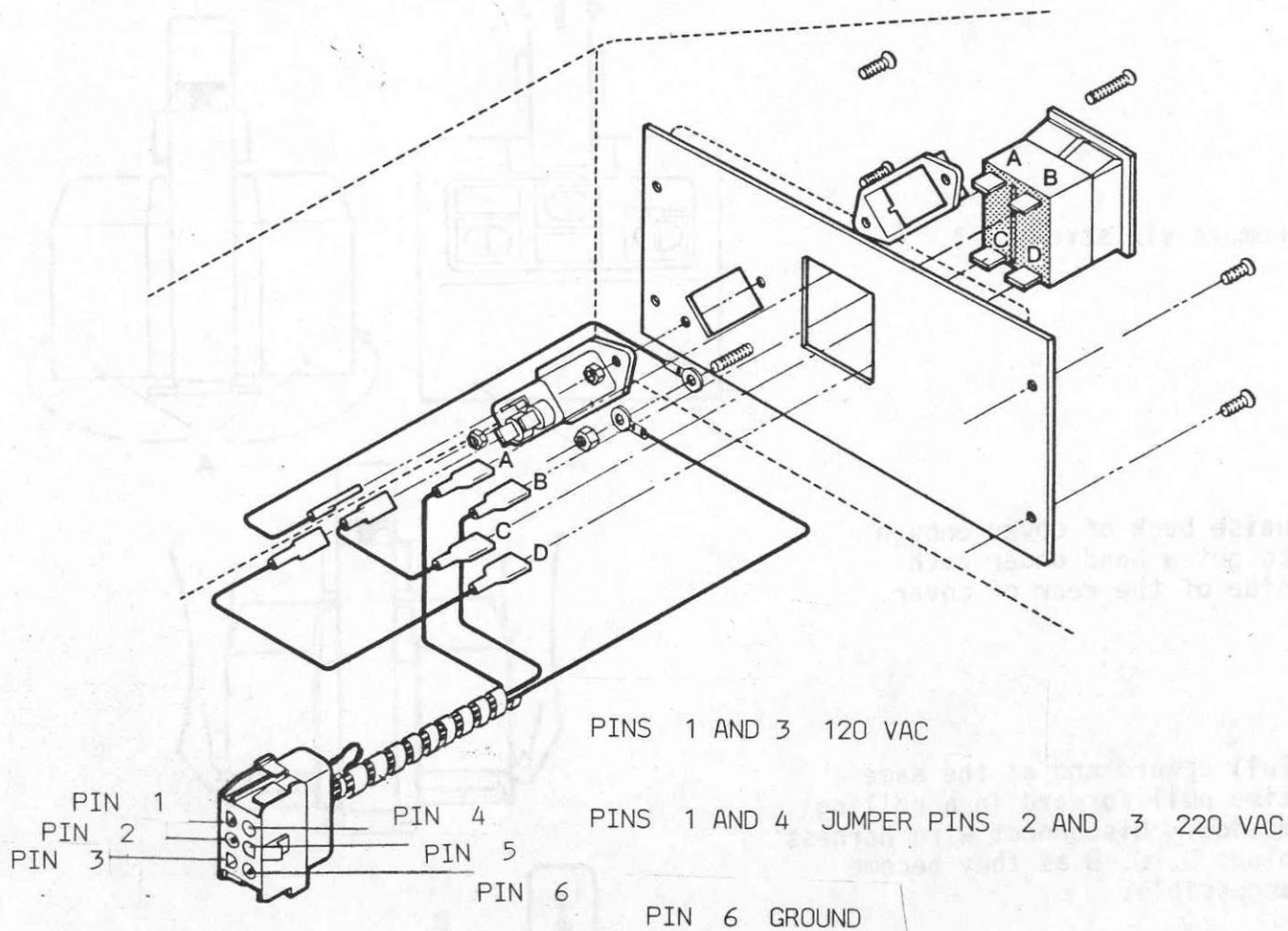
- C. Pull upward and at the same time pull forward in a rolling motion. Disconnect wire harness plugs B, C, D as they become accessible.





POWER SUPPLY FOR TT 92B12, 22, 40

(WIRING CONFIGURATION — INPUT VOLTAGES)



NOTE: Be sure ground (green/yellow stripes) is secured to clean an terminals and grounding continuity is verified.

IF ADDITIONAL INFORMATION OR ASSISTANCE IS NEEDED,
CONSULT THE CUSTOMER SERVICE DEPARTMENT AT THE FACTORY.

INSIDE CALIFORNIA: 714 676-5767

OUTSIDE CALIFORNIA: 800 321-0918

7:30AM TO 4:30PM MONDAY THRU FRIDAY
(PACIFIC TIME ZONE)

Tru-Trac Therapy Products Inc.
27635 Diaz Rd., P.O. Box 880
Temecula, CA 92390
800-321-0918 Outside California
800-828-7891 Inside California